Alabama and Mississippi
Draft Resource Management Plan and Environmental Impact Statement

August 2007

BLM

Eastern States, Jackson Field Office

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Mission Statement

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

BLM/ES/PL-07/001+1610

Cover Photos: Top Left – Point Clear Island, Hancock County, Mississippi; Top Right – Hanging Moss at Big Rock Island, Mitchell Lake Alabama; Middle Right – Fowl River Tract, Mobile County, Alabama; Bottom Left – Fort Morgan Beach Tract, Baldwin County, Alabama; and Bottom Right – Oil rig on Federal lease.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Eastern States
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411 Briarwood Drive, Suite 404
Jackson, Mississippi 39206
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In Reply Refer To:
1610 (020)

Dear Reader:

Attached for your review and comment is the Alabama and Mississippi Draft Resource Management Plan (RMP) and Environmental Impact Statement (EIS) for the Eastern States, Jackson Field Office (JFO). The BLM published a Notice of Intent in the *Federal Register* to prepare this RMP-EIS on July 12, 2002. An official scoping period began with this publication and ran through September 2002. Letters were sent to Alabama and Mississippi State agencies, county supervisors and commissioners, and the governors of both States to inform them of the planning process. The State of Mississippi accepted the invitation to become an official cooperating agency.

The alternative resource management plans described in this document have been designed to resolve land management issues that were identified through the planning process and to provide a basis for comparison of the impacts associated with each alternative. Analyses of the environmental consequences of implementing each of the alternatives are also included in the document. The final decision and Proposed RMP may be one of the alternatives in its entirety or a combination of various actions contained in more than one of the alternatives described in this Draft RMP-EIS.

We invite your comments on the content of this document. A 90-day comment period will begin with the date the Environmental Protection Agency (EPA) publishes the filing of this Draft RMP-EIS in the Federal Register. We are particularly interested in comments that address one or more of the following: 1) possible flaws in the analysis; 2) new information that would have a bearing on the analysis; and 3) needs for clarification. Please send your written comments to:

Gary Taylor
BLM Planning Coordinator
411 Briarwood Drive, Suite 404
Jackson, Mississippi 39206

Comments, including the names and street addresses of respondents, will be made available for review by the public at the address listed above during regular business hours (7:45 a.m. to 4:30 p.m.), Monday through Friday, except holidays, and will be published as part of the Proposed RMP and Final EIS. Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so. All submissions from organizations or businesses and from individuals representing, or who are officials of, organizations or businesses will be made available for public inspection in their entirety.

Comments on the Draft RMP-EIS will be fully considered and evaluated in development of the Proposed RMP and Final EIS. Through your participation in this effort, we can move forward together toward a common goal of improved public land management in Mississippi and Alabama.

Please retain this copy of the Draft RMP-EIS for future reference, as the Proposed RMP and Final EIS may be published in abbreviated format. A copy of this Draft RMP-EIS has been sent to affected Federal, State, and local government agencies and to those persons who indicated they wished to receive a copy. The Draft RMP-EIS can be downloaded from the RMP website at http://www.es.blm.gov/AL_MS_RMP. Copies of the Draft RMP-EIS are available for public inspection at the following BLM locations:

Bureau of Land Management
Eastern States Office
7450 Boston Boulevard
Springfield, Virginia 22153

Bureau of Land Management
Jackson Field Office
411 Briarwood Drive, Suite 404
Jackson, Mississippi 39206

Public participation is important for the successful development of these plans. We ask for your thoughtful evaluation and comments.

Sincerely,

Alan Barron Bail

Acting State Director

Alabama and Mississippi Draft Resource Management Plan and Environmental Impact Statement

for

Public Lands Administered

by the

Bureau of Land Management
Eastern States
Jackson Field Office

Prepared by

United States Department of the Interior
Bureau of Land Management
Eastern States
Jackson Field Office

In cooperation with

The State of Mississippi

August 2007

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DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE ALABAMA AND MISSISSIPPI RESOURCE MANAGEMENT PLAN

Lead Agency: U.S. Department of the Interior, Bureau of Land Management

Type of Action: Administrative

Jurisdiction: Portions of the States of Mississippi and Alabama

Abstract: This Draft Resource Management Plan (RMP) and Environmental Impact Statement (EIS) describes and analyzes a reasonable range of management alternatives for the public lands and resources administered by the Bureau of Land Management (BLM) in the States of Alabama and Mississippi. Within the two States combined, BLM administers approximately 333 acres of public land surface and mineral estate and 704,850 acres of Federal minerals where the surface estate is in non-Federal ownership. BLM also has responsibility for 126,570 acres of mineral estate where the surface is managed by other Federal agencies (excluding BLM and U.S. Forest Service [USFS]). For the purposes of this document, RMP mineral leasing decisions will apply to "BLM-administered non-USFS Federal mineral ownership (FMO)," which refers to BLM-administered Federal minerals where the surface estate is in non-Federal ownership and Federal agencies excluding USFS. BLM has responsibility for lease issuance and post lease administration of 1,640,621 acres of mineral estate where the surface is managed by USFS. However, the RMP will not make decisions on oil and gas leasing of national forest acreage because the Federal Onshore Oil and Gas Reform Act of 1987 requires the USFS to conduct a leasing analysis to make land use planning decisions on oil and gas leasing. This legal requirement does not apply to other Federal surface management agencies.

Four alternatives are analyzed in detail, including the Preferred Alternative. The management prescriptions of the four alternatives would guide management of BLM-administered lands (referred to as surface tracts) and non-USFS FMO in Alabama and Mississippi. The management alternatives evaluated in this Draft RMP-EIS were developed to meet management goals and objectives and minimize adverse impacts to cultural and natural resources while providing for compatible resource use and development opportunities consistent with current laws, regulations, and policies.

Comments on this Draft RMP-EIS will be accepted for 90 days following the date that the Environmental Protection Agency (EPA) publishes the notice of filing this Draft EIS in the Federal Register. Further information regarding this Draft EIS can be obtained from:

Gary Taylor
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EXECUTIVE SUMMARY

INTRODUCTION

This Draft Resource Management Plan (RMP) and Environmental Impact Statement (EIS) describes and analyzes a reasonable range of management alternatives for the public lands and resources administered by the Bureau of Land Management (BLM) in the States of Alabama and Mississippi. Within the two States combined, BLM administers approximately 333 acres of public land surface and mineral estate and 704,850 acres of Federal minerals where the surface estate is in non-Federal ownership. BLM also has responsibility for 126,570 acres of mineral estate where the surface is managed by other Federal agencies (excluding BLM and U.S. Forest Service [USFS]). On these lands, oil and gas leasing of Federal minerals is subject to management as directed by the surface managing agency, and the decisions of this RMP will pertain only to BLM's role in administering the minerals. BLM has the responsibility for lease issuance and post lease administration of 1,640,621 acres of mineral estate where the surface is managed by USFS. However, the RMP will not make decisions on oil and gas leasing of national forest acreage because the Federal Onshore Oil and Gas Reform Act of 1987 requires the USFS to conduct a leasing analysis to make land use planning decisions on oil and gas leasing. This legal requirement does not apply to other Federal surface management agencies. For the purposes of this document, RMP decisions will apply to "BLM-administered non-USFS Federal mineral ownership (FMO)," which refers to BLM-administered Federal minerals where the surface estate is in non-Federal ownership and Federal agencies excluding USFS.

Within the two States, there are also 8,077 acres of lands with uncertain title. These are public domain lands according to General Land Office records, but may have private claims of ownership. The RMP will not make management decisions on these lands per se; however, these lands, which are listed in Appendix B, will be available for disposal to qualified applicants under the Color-of-Title Act. The above categories of BLM-administered land ownership that will be covered by this RMP are listed and described in Table 1-1 for Alabama and Table 1-2 for Mississippi.

DESCRIPTION OF THE DRAFT RMP-EIS ALTERNATIVES

Four alternatives are analyzed in detail, including the Preferred Alternative. The management prescriptions of the four alternatives described in Chapter 2 would guide management of BLM-administered lands (referred to as surface tracts) and non-U.S. Forest Service Federal mineral ownership (non-USFS FMO) in Alabama and Mississippi. An interdisciplinary team developed the alternatives to present a reasonable range of management options for guiding resource management and activities. The management alternatives evaluated in this Draft RMP-EIS were developed to meet management goals and objectives and minimize adverse impacts to cultural and natural resources while providing for compatible resource use and development opportunities consistent with current laws, regulations, and policies.

Each alternative represents a direction to guide future management of BLM-administered public lands and resources. Alternative 3 was selected as the Preferred Alternative because it protects sensitive resources, while allowing mineral development and providing management efficiency through disposal of most of the scattered surface tracts.

Management themes represented in each alternative include the following:

- **Alternative 1 (No Action)—**represents the No Action Alternative (i.e., continuation of current management). BLM would continue the current management approach by retaining all BLM-administered surface tracts and employing custodial management. BLM management actions would occur in response to an application for use presented by another entity or compliance actions required by regulation and policy (as described in Section 2.3, Standard Management Common to All Alternatives). Potential impacts and mitigation would be identified and assessed when application is made for activity on a specific piece of BLM-administered land.

  There would be 760,570 acres of BLM-administered non-USFS FMO that would be open to oil and gas leasing. Management of oil and gas leasing, exploration, and development would be subject to the standard lease terms and conditions that are included on the lease form.

- **Alternative 2—**proposes that BLM would retain specific BLM-administered surface tracts. BLM would investigate opportunities to manage the tracts in partnership with other agencies or organizations. Use of the tracts would be consistent with management objectives and other land use decisions. Tract-specific constraints for resource uses, such as ROW access, would be based on the presence of sensitive resources (e.g., special status species and important cultural resources). In addition to the management for fish and wildlife habitat, special status species, and cultural resources outlined in Alternative 1, more proactive management would occur on specific tracts to protect important natural and cultural resources. Management actions for specific tracts, as needed, could include installing walk-overs and sand fencing on actively used tracts to protect special status species habitat, vegetation treatments to enhance or improve native landscapes on actively used tracts, and habitat management to achieve objectives in established fish and wildlife conservation strategies.

  There would be 760,452 acres of BLM-administered non-USFS FMO that would be open to oil and gas leasing; since an additional 365 acres would be closed to protect habitat of the Federally-listed Alabama beach mouse. In addition to standard terms and conditions, conservation measures would be applied as stipulations to oil and gas leases and BMPs would be used to reduce adverse effects caused surface-disturbing or disruptive activities associated with oil and gas operations on BLM-administered non-USFS FMO. Conservation measures, including no surface occupancy (NSO), controlled surface use (CSU), and seasonal stipulations, and BMPs are presented in Appendix D. Under this alternative, lease stipulations would include a 1,000-feet NSO buffer from aquatic habitats and Alabama beach mouse habitat would not be available for lease. The stipulations in Appendix D would be applied in addition to the standard lease terms and conditions on the lease form. For each stipulation there are provisions for waiver, modification, and exception provided in Appendix D, which could be applied as appropriate. The BMPs would be considered mandatory to reduce adverse impacts to specific resources and would be applied to oil and gas operations on new and existing leases. There would be some flexibility in implementation of each BMP, depending on site-specific conditions. Where there is potential to affect Federally listed, proposed, or candidate species or designated critical habitat, application of BMPs and/or waiver, modification and exception to stipulations would normally require coordination and possible formal consultation with USFWS.

- **Alternative 3 (Preferred Alternative)—**All of the BLM-administered surface tracts would be available for disposal except the Hancock County tract in Mississippi. For some of the surface tracts, there would be conditions placed on the disposal that development and use of the tract would be consistent with the resource management objectives and allowable uses established for the tract. Restrictions on use after disposal would be provided in the patent transferring ownership. Valid existing rights and other valid authorizations would be protected if disposal occurred.

Until the surface tracts are disposed, management would apply tract-specific constraints for resource uses, such as ROW access, based on the presence of sensitive resources (e.g., special status species and important cultural resources). In addition to the management for fish and wildlife habitat, special status species, and cultural resources outlined in Alternative 1, more proactive management would occur on specific tracts to protect important natural and cultural resources. Management actions for specific tracts, as needed, could include vegetation treatments to enhance or improve native landscapes on actively used tracts and habitat management to achieve objectives in established fish and wildlife conservation strategies.

There would be 760,570 acres of BLM-administered non-USFS FMO that would be open to oil and gas leasing. Similar to Alternative 2, Alternative 3 uses conservation measures that would be applied as lease stipulations and BMPs to reduce adverse effects caused by surface-disturbing or disruptive activities associated with oil and gas operations on BLM-administered non-USFS FMO. The stipulations in Alternative 3 are different from Alternative 2 in two ways. First, Alabama beach mouse habitat would be available for lease, but subject to a NSO stipulation. Second, the buffer from aquatic habitats would be reduced to 250-feet.

- **Alternative 4—**Alternative 4 proposes that all BLM-administered surface tracts would be made available for disposal from Federal ownership with no specific condition on use after disposal. Valid existing rights and other valid authorizations would be protected in the event of disposal. Under this alternative, management of BLM-administered non-USFS FMO would be the same as Alternative 3.

ENVIRONMENTAL CONSEQUENCES

The environmental consequences that could result from the management prescriptions of the four alternatives are described in Chapter 4 and are summarized and compared in Table 2-13, Comparison of Impacts for Alabama and Table 2-14, Comparison of Impacts for Mississippi. These potential consequences are discussed for each resource program, providing an analysis of environmental effects resulting from management of all resources and resource uses. This includes an analysis of cumulative effects, which are defined as the impacts that result from the incremental impact of an action when added to other past, present, or reasonably foreseeable future actions.

CONSULTATION AND COORDINATION

Consultation, coordination and public involvement were undertaken by BLM throughout the process of developing this Draft RMP-EIS. Consultation, coordination, and public involvement in preparing this Draft RMP-EIS have been accomplished through public and informal meetings, individual contacts, bulletins, news releases, and *Federal Register* notices.

BLM consulted and coordinated with federal and state agencies and Native American tribes in developing this Draft RMP-EIS. Specifically, BLM has coordinated with the USFWS to obtain a species list and develop best management practices and oil and gas leasing stipulations for the alternatives. BLM coordinated on the state level by contacting Alabama and Mississippi State agencies, county supervisors and commissioners, and the governors of both States to inform them of the RMP planning process. In addition, BLM contacted appropriate Native American tribes, inviting them to participate in the Alabama and Mississippi RMP-EIS development process, and offered to meet with tribal leaders or representatives in person to discuss issues, concerns, and questions they might have.

Public Involvement

Public participation in the RMP-EIS process includes a variety of efforts to identify and address public concerns and needs. The public involvement process assists the agencies in broadening the information base for decision-making, informing the public about the RMP-EIS and the potential impacts associated with various management decisions, and ensuring that public needs and viewpoints are understood by the agency.

A public workshop (with an emphasis on BLM tracts in Baldwin County, Alabama) was held in Gulf Shores, Alabama, on September 2, 2004, to solicit additional comments for developing alternatives. The workshop was conducted in an open house format, with resource stations and BLM staff available for individual discussions. Eight participants attended the workshop, including representatives from the Alabama State Lands Division. Information meetings with Baldwin County also took place during this period. Although BLM provided a deadline of November 30, 2004 to receive information and input via mail, e-mail, or the project Web site, none was submitted; however, BLM accepted input from the public and interested agencies throughout the planning process. Comment letters that were submitted after the November deadline dealt primarily with the Baldwin County land tracts and how they should be managed by BLM. All comments were collected, analyzed, and included in the project administrative record.

Cooperating Agencies

The primary role of cooperating agencies (also referred to as cooperators) is to provide special expertise and/or assistance to the lead agency throughout the RMP-EIS process. Cooperator roles include participation in the scoping process, provision of information and assistance to the lead agency, review of draft information, and provision of overall advice during the planning process.

Letters were sent to the States of Alabama and Mississippi requesting their involvement in the planning process as cooperating agencies. The State of Mississippi accepted the invitation to become an official cooperating agency.

CHAPTER 1—PURPOSE AND NEED

1.1 INTRODUCTION

The Bureau of Land Management (BLM) Eastern States, Jackson Field Office (JFO) has initiated the planning process to develop a Resource Management Plan (RMP) for public lands and mineral estate dispersed across the states of Alabama and Mississippi. An Environmental Impact Statement (EIS) is being prepared as part of this project. The State of Mississippi is a cooperating agency, as defined by the Council on Environmental Quality’s (CEQ’s) regulations implementing the National Environmental Policy Act of 1969 (NEPA), for this RMP.

1.2 PURPOSE AND NEED FOR THE PLAN

Until now, BLM resource management in the States of Alabama and Mississippi has been governed by project-specific planning analyses and environmental assessments (EAs); however, preparing separate project-specific documents whenever BLM receives external proposals has been inefficient, costly, and has delayed decision making on industry-driven requests to lease Federal minerals and land tenure adjustments where BLM retains surface management responsibilities. The planning criteria identified in Section 1.3.2 sets out BLM’s primary responsibilities in Alabama and Mississippi, which is to make minerals available for leasing, where appropriate, and to make land tenure adjustments according to the criteria found in the Federal Land Policy and Management Act of 1976 (FLPMA; 43 United States Code [USC] 1711-1712).

By preparing a single land use plan for both States, BLM will be able to respond to mineral leasing proposals and deal efficiently with the long-term management of its scattered lands. The Alabama and Mississippi RMP will provide the JFO with a comprehensive framework for managing BLM-administered land and minerals within these States. Completion of the RMP will meet the mandate of FLPMA that public lands be managed for multiple use and sustained yield under an approved RMP. Preparation of the RMP will also fulfill BLM’s responsibilities for public involvement and environmental impact analysis under NEPA. NEPA requires Federal agencies to prepare an EIS for any Federal action that could significantly affect the human environment. Preparation and adoption of an RMP constitutes such an action. The EIS prepared in conjunction with this Draft RMP serves to analyze proposed actions and decisions affecting BLM-administered land in the planning area.

A primary goal of the RMP is to develop management practices, including stipulations, to ensure long-term sustainability of a healthy and productive landscape. An RMP is a set of comprehensive, long-range decisions concerning the use and management of resources administered by BLM. In general, the RMP will serve two purposes: (1) provide an overview of goals, resource condition objectives, and needs associated with public lands management and (2) resolve multiple use conflicts or issues. When the RMP is approved, its management decisions will remain in effect until the RMP is amended, revised, or replaced by a new plan. The life of the RMP is expected to be 10 to 20 years.

1.3 DESCRIPTION OF THE PLANNING AREA

This Draft RMP-EIS covers all the public lands resources administered by BLM in the States of Alabama and Mississippi. Within the two States combined, BLM administers approximately 333 acres of public land surface and mineral estate and 704,850 acres of Federal minerals where the surface estate is in non-

Federal ownership. BLM also has responsibility for 126,570 acres of mineral estate where the surface is managed by other Federal agencies (excluding BLM and U. S. Forest Service [USFS]). On these lands, leasing of Federal minerals is subject to management as directed by the surface managing agency, and the decisions of this RMP will pertain only to BLM's role in administering the minerals. BLM has the responsibility of 1,640,621 acres of mineral estate where the surface is managed by USFS. However, the RMP will not make decisions on oil and gas leasing of national forest acreage because by regulation, USFS is responsible for land use planning decisions on oil and gas leasing. For the purposes of this document, RMP mineral leasing decisions will apply to "BLM-administered non-USFS Federal mineral ownership (FMO)," which refers to BLM-administered Federal minerals where the surface estate is in non-Federal ownership and Federal agencies excluding USFS.

Within the two States, there are also 8,077 acres of lands with uncertain title. These are public domain lands according to General Land Office records, but may have private claims of ownership. The RMP will not make management decisions on these lands per se; however, these lands, which are listed in Appendix B, will be available for disposal to qualified applicants under the Color-of-Title Act. The above categories of BLM-administered land ownership that will be covered by this RMP are listed and described in Table 1-1 for Alabama and Table 1-2 for Mississippi.

Table 1-1. Land and Mineral Ownership and Administrative Jurisdictions within the RMP Planning Area in Alabama

Jurisdiction	Acreage[1]
Areas in Alabama covered by the Alabama and Mississippi RMP-EIS	
A. BLM surface land—Federal minerals[2]	159
B. Non-Federal surface land—Federal minerals[3]	303,440
C. Federal agency (other than BLM or USFS) surface land—Federal minerals[4]	10,220
Total BLM-administered Federal land surface to be covered by RMP decisions	**159**
Total BLM-administered Federal mineral estate to be covered by RMP decisions	**313,819**
D. Lands of uncertain title[5]	3,057
Areas in Alabama *not* covered by the Alabama and Mississippi RMP-EIS	
E. USFS land-Federal minerals[6]	585,394

[1] Where one or more mineral resource categories are Federally-owned, the acreage is listed as if all minerals are Federally-owned. Where mixed minerals ownership occurs (for example, privately owned coal interest overlapping with Federally-owned oil and gas interest), minerals planning and management decisions in the RMP will pertain only to the Federally-owned mineral interests. Federal mineral acreage is derived from BLM data of current and former oil and gas leases. Data includes lands described by aliquot parts, metes and bounds, or lot number. In the case of metes and bounds and lot number descriptions, the acreage reflects that of the entire section associated with the description, otherwise known as "nominal acreage."

[2] In those areas where the Federal land surface and Federal mineral estate are both administered by BLM, the RMP decisions will cover both the land surface and the mineral estate.

[3] In those areas where (1) the land surface is privately owned or owned by a non-Federal government jurisdiction and (2) the minerals are Federally owned, the RMP decisions will cover only the BLM-administered Federal mineral estate. Although the land and resource uses and values on the non-Federal surface will be taken into account and will affect development of the Federal mineral management decisions, these decisions will pertain only to the Federally owned minerals.

[4] In those areas where (1) the Federal land surface is administered by a Federal agency other than BLM or USFS, including the Department of Defense and U. S. Army Corp of Engineers and (2) the Federal mineral estate is administered by BLM, the land surface planning and management decisions are the responsibility of the other Federal surface managing agency, lease of the Federal minerals is subject to management as directed by the surface managing agency. These are lands that were either acquired by a Federal agency, or were withdrawn from the public domain; withdrawn lands are listed in Appendix I. RMP decisions for these lands will pertain only to BLM's role in administering the Federal minerals.

[5] These are public domain lands according to General Land Office records, but may have private claims of ownership. The RMP will not make decisions on these lands per se; however, these lands, which are listed in Appendix B, will be available for disposal to qualified applicants under the Color-of-Title Act.

[6] In those areas where (1) the Federal land surface is administered by the USFS, and (2) planning decisions for surface

Jurisdiction	Acreage[1]

management and for mineral leasing, pursuant to the Federal Onshore Oil and Gas Leasing Reform Act of 1987 and Federal regulation (36 CFR 228.102), are the responsibility of USFS, and (3) BLM has responsibility for issuing and administering mineral leases; the RMP will not include management decisions for the Federal minerals on these lands, and BLM will carry out its minerals management responsibilities under the guidance of USFS land use plans. At the same time, surface and minerals management actions and development activities anticipated on these lands will be taken into account for purposes of cumulative impact analysis.

Table 1-2. Land and Mineral Ownership and Administrative Jurisdictions within the RMP Planning Area in Mississippi

Jurisdiction	Acreage[1]
Areas in Mississippi covered by the Alabama and Mississippi RMP-EIS	
A. BLM surface land-Federal minerals[2]	174
B. Non-Federal land-Federal minerals[3]	401,410
C. Federal agency (other than BLM or USFS) surface land / Federal minerals[4]	116,350
Total BLM-administered Federal land surface to be covered by RMP decisions	**174**
Total BLM-administered Federal mineral estate to be covered by RMP decisions	**517,934**
D. Lands of uncertain title[5]	5,020
Areas in Mississippi *not* covered by the Alabama and Mississippi RMP-EIS	
E. USFS land-Federal minerals[6]	1,055,227

1 Where one or more mineral resource categories are Federally-owned, the acreage is listed as if all minerals are Federally-owned. Where mixed mineral ownership occurs (for example, privately owned coal interest overlapping with Federally - owned oil and gas interest), minerals planning and management decisions in the RMP will pertain only to the Federally-owned mineral interest. Federal mineral acreage is derived from BLM data of current and former oil and gas leases. Data includes lands described by aliquot parts, metes and bounds, or lot number. In the case of metes and bounds and lot number descriptions, the acreage reflects that of the entire section associated with the description, otherwise known as "nominal acreage."

2 This is a tract of land in Hancock County where the mineral estate is Federally owned and the surface is currently owned by the University of Mississippi. The tract was conveyed to the university in 1961, under the authority of the Recreation and Public Purposes Act of 1926, for recreational and research site purposes. The patent contains a clause stating that ownership of the surface estate shall revert to the United States if the land is devoted to a use other than that for which the land was conveyed. It is expected that the university will relinquish this tract and that title will revert to the United States. In anticipation of the title transfer, this tract will be considered BLM-managed surface estate for land use planning purposes; therefore, the RMP decisions will cover both the land surface and the mineral estate.

3 In those areas where (1) the land surface is privately owned or owned by a non-Federal government jurisdiction and (2) the minerals are Federally owned, the RMP decisions will cover only the BLM-administered Federal mineral estate. Although the land and resource uses and values on the non-Federal surface will be taken into account and will affect development of the Federal mineral management decisions, these decisions will pertain only to the Federally owned minerals.

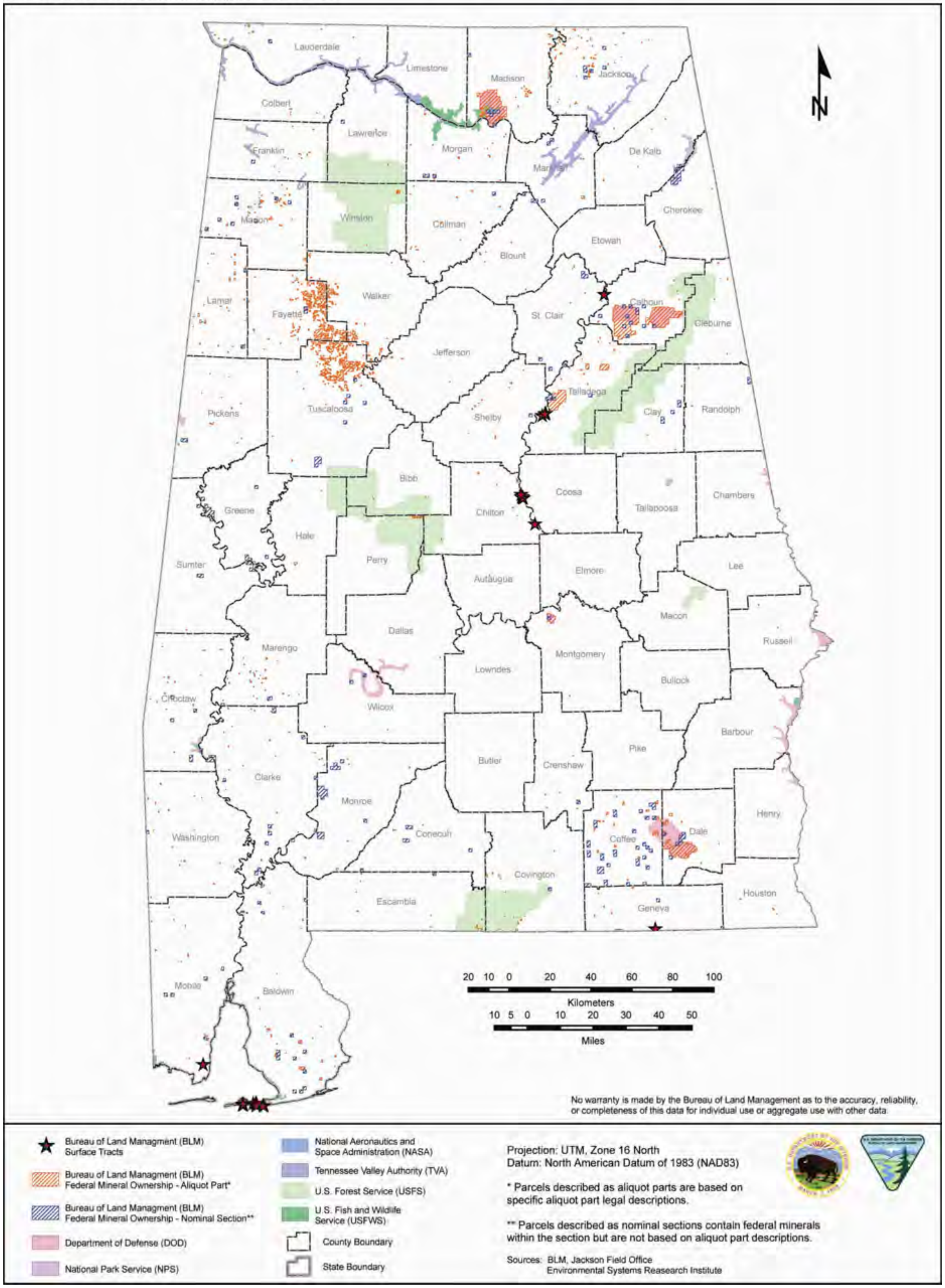
4 In those areas where (1) the Federal land surface is administered by a Federal agency other than BLM or USFS, including the Department of Defense and U. S. Army Corp of Engineers and (2) the Federal mineral estate is administered by BLM, the land surface planning and management decisions are the responsibility of the other Federal surface managing agency, and lease of the Federal minerals is subject to management as directed by the surface managing agency. These are lands that were either acquired by a Federal agency, or were withdrawn from the public domain. Withdrawn lands are listed in Appendix I. RMP decisions for these lands will pertain only to BLM's role in administering the Federal minerals.

5 These are public domain lands according to General Land Office records, but may have private claims of ownership. The RMP will not make decisions on these lands per se; however, these lands, which are listed in Appendix B, will be available for disposal to qualified applicants under the Color-of-Title Act.

6 In those areas where (1) the Federal land surface is administered by the USFS, and (2) planning decisions for surface management and for mineral leasing, pursuant to the Federal Onshore Oil and Gas Leasing Reform Act of 1987 and Federal regulation (36 CFR 228.102), are the responsibility of USFS, and (3) BLM has responsibility for issuing and administering mineral leases; the RMP will not include management decisions for the Federal minerals on these lands, and BLM will carry out its minerals management responsibilities under the guidance of USFS land use plans. At the same time, surface and minerals management actions and development activities anticipated on these lands will be taken into account for purposes of cumulative impact analysis.

Map 1-1: Federal Lands and Mineral Ownership in Alabama

Alabama and Mississippi RMP-EIS



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

Projection: UTM, Zone 16 North
Datum: North American Datum of 1983 (NAD83)

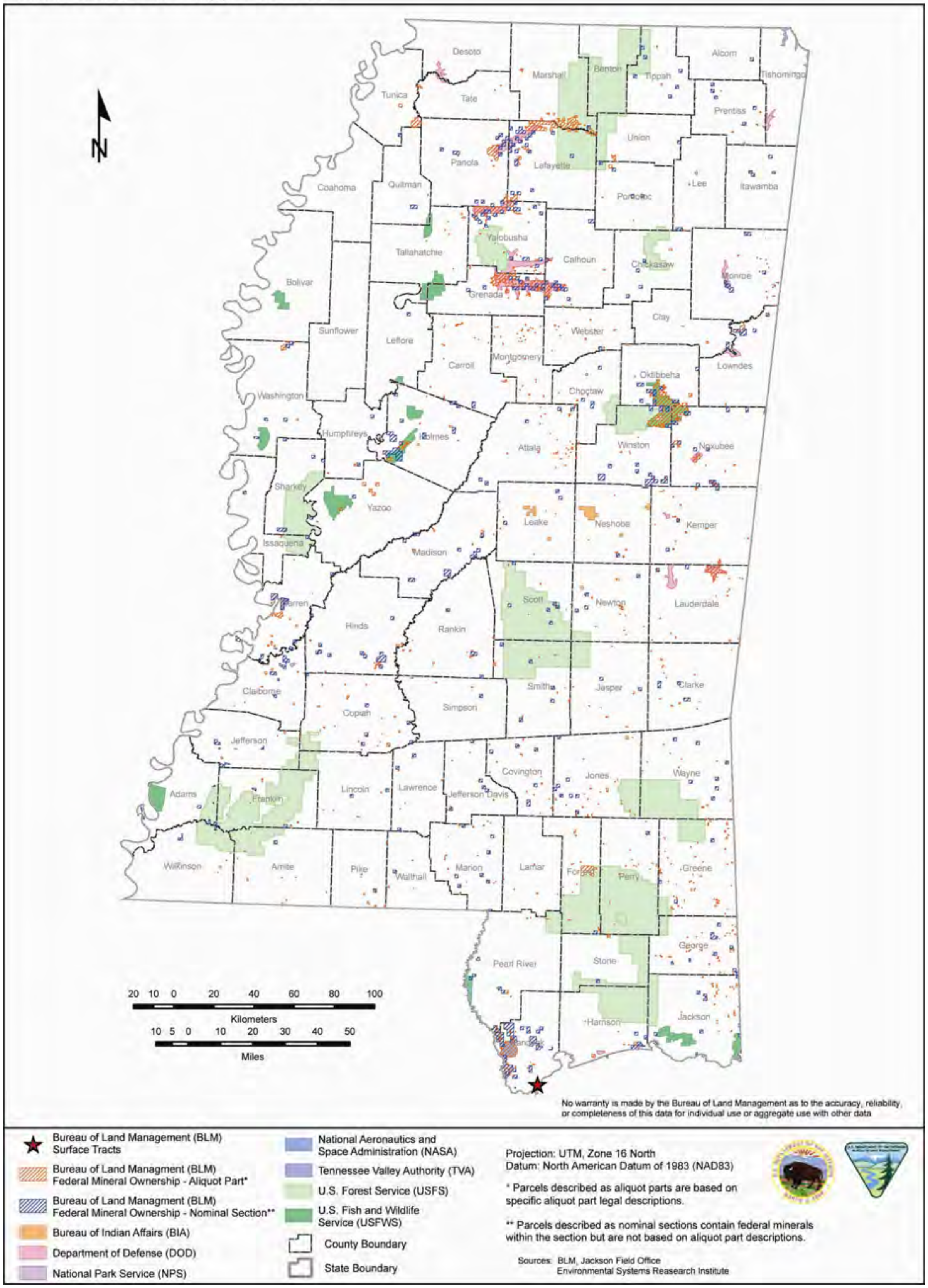
* Parcels described as aliquot parts are based on specific aliquot part legal descriptions.

** Parcels described as nominal sections contain federal minerals within the section but are not based on aliquot part descriptions.

Sources: BLM, Jackson Field Office
Environmental Systems Reasearch Institute

Map 1-2: Federal Lands and Mineral Ownership in Mississippi

Alabama and Mississippi RMP-EIS



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data

Projection: UTM, Zone 16 North
Datum: North American Datum of 1983 (NAD83)

* Parcels described as aliquot parts are based on specific aliquot part legal descriptions.

** Parcels described as nominal sections contain federal minerals within the section but are not based on aliquot part descriptions.

Sources: BLM, Jackson Field Office
Environmental Systems Reasearch Institute

1.4 PLANNING ISSUES

In addition to the planning issues identified below, the Draft RMP-EIS includes decisions on a wide range of other resource management concerns, including cultural resources, lands and realty, minerals, recreation, socioeconomics, soil resources, water resources, vegetative communities, and fish and wildlife habitat, as identified in the July 12, 2002, *Federal Register* notice.

1.4.1 Mineral (Oil, Gas, and Coal) Leasing

There is a potential for continued mineral development of BLM-administered FMO in both Alabama and Mississippi. In some cases, there could be potential for impacts on sensitive resources or conflicts with other uses. These impacts and conflicts need to be considered when making decisions on the availability of non-USFS FMO for development. The RMP addresses mineral leasing by offering a variety of alternative solutions, as described in Chapter 2.

1.4.2 Land Ownership Adjustments

BLM-administered lands in both Alabama and Mississippi are relatively small, isolated parcels. Some of the parcels could have natural resources of significant value to the public and could be suitable for management by BLM or other agencies. Other parcels could be suitable for disposal. The RMP addresses land ownership adjustments by offering a variety of alternative solutions, as described in Chapter 2.

1.5 PLANNING CRITERIA

Planning criteria are constraints or ground rules that guide development of BLM land use plans. These criteria ensure the planning team focuses on relevant uses and collects applicable data for analysis, and the criteria include applicable Federal laws, regulations, executive orders, and policies. As identified in the *Federal Register* on July 12, 2002, the following criteria were developed to guide the preparation of the RMP:

1. Land use planning and environmental analysis will be conducted in accordance with laws, regulations, executive orders, and manuals. Planning will be conducted for BLM-administered lands (tracts) and minerals (BLM-administered non-USFS FMO).
2. Surface tracts will be mapped and identified by legal description. Land use policy will be established for BLM-administered lands identified after the RMP is completed.
3. A reasonably foreseeable development scenario (RFDS) will be prepared for the future leasing (and development) of fluid minerals under split-estate lands (e.g., non-BLM surface and BLM minerals). The RFDS will be developed on a regional (county) basis. Areas of high, moderate, and low oil and gas potential will be identified (mapped) for each State.
4. Areas with the potential for non-energy solid mineral leasing (e.g., phosphates, sodium) will be evaluated for inclusion in the RMP.
5. Resource data needed to evaluate the impacts of future (foreseeable) mineral development will be collected on a regional basis.
6. The planning team will work cooperatively with Federal, State, county, and local governments and agencies; tribal governments; groups and organizations; and individuals.

Based on further analysis these criteria have been revised as follows:

1. Land use planning and environmental analysis will be conducted in accordance with laws, regulations, executive orders, and manuals. Planning will be conducted for BLM-administered lands (tracts) and minerals (BLM-administered non-USFS FMO).
2. Surface tracts will be mapped and identified by legal description. Lands of uncertain title will be listed. These lands could potentially be available for disposal under the Color-of-Title Act.
3. An RFDS will be prepared for the future leasing (and development) of oil and gas. The RFDS will be developed on a statewide basis. Areas of high, moderate, and low oil and gas potential will be identified (mapped) for each State.
4. The evaluation of lands based on their suitability for further coal leasing consideration will be limited to underground mining of non-USFS FMO in the Warrior Basin in Alabama.
5. Areas with the potential for non-energy solid mineral leasing (e.g., phosphates, sodium) were evaluated for inclusion in the RMP. No potential was identified for development of these minerals on non-USFS FMO; therefore, non-energy solid mineral leasing is not addressed.
6. Resource data needed to evaluate the impacts of future (foreseeable) mineral development will be collected on a statewide basis.
7. The planning team will work cooperatively with Federal, State, county, and local governments and agencies; tribal governments; groups and organizations; and individuals.

1.6 OVERVIEW OF THE PLANNING PROCESS

The BLM planning process is detailed in the *BLM Land Use Planning Handbook* (H-1601-1), which provides guidance to BLM employees for implementing the BLM land use planning requirements established by Section 202 of the FLPMA and the regulations in 43 Code of Federal Regulations (CFR) 1610. The process for preparing an EIS is determined by Federal regulations implementing NEPA (40 CFR 1500-1508). The major steps in the BLM planning process are shown in Figure 1-1 and are further described below.

- **Preparation Plan.** BLM developed a preparation plan to outline anticipated planning issues and management concerns, preliminary planning criteria, data needs, process participants, plan format, schedule, and public involvement.

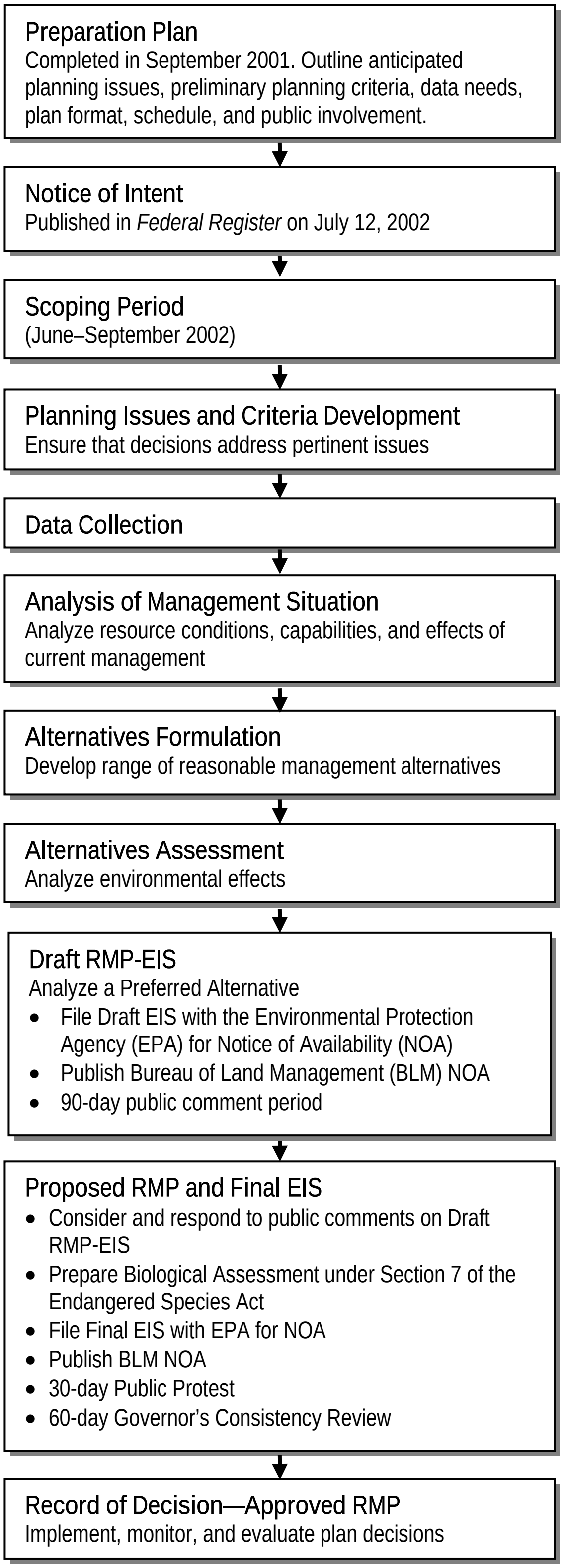
- **Notice of Intent.** BLM published a Notice of Intent (NOI) in the *Federal Register* on July 12, 2002, to announce its intention to prepare an RMP and EIS. The NOI also solicited coal information for BLM-administered coal in Alabama and Mississippi and identified planning criteria to guide the preparation of the RMP.

- **Scoping Period.** Public scoping was conducted from June through September 2002. The objectives of scoping were to involve the public in the planning process and to comply with FLPMA and NEPA. Scoping is a process of soliciting public input and identifying concerns regarding management of public lands and BLM-administered non-USFS FMO in the planning area. Scoping consisted of public notification through the *Federal Register* (i.e., publication of the NOI) and by letter and e-mail. Letters of invitation to participate as cooperating agencies were sent to government agencies in Alabama and Mississippi. BLM also notified local, State, and Federal agencies and Native American tribes during this period.

- **Analysis of Management Situation.** As part of preparing this Draft RMP-EIS, BLM analyzed the resource conditions, capabilities, and effects of current management for use as a reference throughout the planning process. As contained in Chapter 3 of the Draft RMP-EIS, this analysis included a description of the physical and biological characteristics and condition of the resources within the planning area and how they are being used and/or protected.

- **Draft RMP-EIS.** This Draft RMP-EIS considers public and agency comments received during the scoping period, includes a description of alternatives and the affected environment, and offers an assessment of potential impacts from implementing the alternatives. A Notice of Availability (NOA) for the Draft RMP-EIS will be published in the *Federal Register*.
- **Comment Period and Public Meetings.** The public and local, State, and Federal agencies and Native American tribes may review and comment on the Draft RMP-EIS during a 90-day comment period, beginning the date the Environmental Protection Agency (EPA) publishes their NOA in the *Federal Register*. BLM will hold public meetings, as necessary, to receive comments from the public. Opportunities for public involvement are further described in Chapter 5, Consultation and Coordination.
- **Proposed RMP and Final EIS.** The purpose of the Proposed RMP-Final EIS is for BLM to assess, consider, and respond to public and agency comments received on the Draft RMP-EIS. An NOA will be published in the *Federal Register* by BLM when the Proposed RMP-Final EIS becomes available. A 30-day public protest period, beginning the date the Environmental Protection Agency (EPA) publishes their NOA in the *Federal Register*, will follow the release of the Proposed RMP-Final EIS. A 60-day Governor's consistency review will also occur at this time.
- **Biological Assessment (BA).** Section 7 of the Endangered Species Act (ESA; 16 U. S.C. Section 1536(a)(2)) requires all Federal agencies to determine whether their actions may affect listed or proposed species and designated and proposed critical habitat. A BA is prepared for the purpose of analyzing the potential effects of the project on Federally-listed species and critical habitat in order to establish and justify an "effect determination." The BA is reviewed by the U. S. Fish and Wildlife Service (USFWS) under the ESA Section 7 consultation requirements.

Figure 1-1. RMP-EIS Process


Preparation Plan
Completed in September 2001. Outline anticipated planning issues, preliminary planning criteria, data needs, plan format, schedule, and public involvement.
Notice of Intent
Published in *Federal Register* on July 12, 2002
Scoping Period
(June–September 2002)
Planning Issues and Criteria Development
Ensure that decisions address pertinent issues
Data Collection
Analysis of Management Situation
Analyze resource conditions, capabilities, and effects of current management
Alternatives Formulation
Develop range of reasonable management alternatives
Alternatives Assessment
Analyze environmental effects
Draft RMP-EIS
Analyze a Preferred Alternative
• File Draft EIS with the Environmental Protection Agency (EPA) for Notice of Availability (NOA)
• Publish Bureau of Land Management (BLM) NOA
• 90-day public comment period
Proposed RMP and Final EIS
• Consider and respond to public comments on Draft RMP-EIS
• Prepare Biological Assessment under Section 7 of the Endangered Species Act
• File Final EIS with EPA for NOA
• Publish BLM NOA
• 30-day Public Protest
• 60-day Governor's Consistency Review
Record of Decision—Approved RMP
Implement, monitor, and evaluate plan decisions

- **Record of Decision.** The Record of Decision (ROD) is a separate and concise public record that clearly identifies and describes the approved RMP and links BLM's decision to the analysis presented in the EIS. The ROD addresses how environmental impacts and other factors were considered in the decision making process.

This Draft RMP-EIS provides a comprehensive evaluation of BLM's potential management and land tenure adjustment actions for public lands in Alabama and Mississippi and their natural resources. A comprehensive RMP-EIS that includes all of BLM's management programs is needed to address potential conflict among interrelated management actions. This EIS also allows for tiering (40 CFR 1505.28) subsequent activity or project-specific EISs or EAs conducted on public lands within Alabama and Mississippi. Subsequent lower-level EISs or EAs will reference and adopt relevant information and goals from this broader, two-State RMP-EIS as formal NEPA documentation, thereby avoiding duplication of effort and reducing costs associated with completing future NEPA analyses.

1.7 READER'S GUIDE TO THIS DOCUMENT

This Draft RMP-EIS is organized according to BLM's land use planning guidance (H-1610-1 and 43 CFR 1601 *et seq*.), the *BLM NEPA Handbook* (H-1790-1), CEQ guidelines, and Federal regulations implementing NEPA (40 CFR Parts 1500–1508). This Draft RMP-EIS has been developed to address issues, concerns, and conflicts within the planning area and to provide guidance for management of BLM-administered lands in both States. It contains the following major chapter headings and information:

Chapter 1—Purpose and Need. Contains background and introductory material such as the purpose and need for the Draft RMP-EIS and the BLM planning process.

Chapter 2—Alternatives. Identifies BLM-administered surface tracts and non-USFS FMO and describes alternative development and management guidance common to all alternatives. The chapter presents specific management actions proposed under the alternatives and a comparative summary of the impacts of the alternatives that have been analyzed in detail. It also identifies the Preferred Alternative.

Chapter 3—Affected Environment. Describes the affected environment, focusing on the existing environmental conditions that would be affected by implementation of the alternatives.

Chapter 4—Environmental Consequences. Describes the impacts of the alternatives. This section forms the scientific and analytic basis for the comparison of impacts presented in Chapter 2.

Chapter 5—Consultation and Coordination. Describes the overall EIS scoping process and other agency consultation and public involvement activities. A list of agencies, organizations, and individuals who were sent the Draft EIS is also presented.

List of Abbreviations and Acronyms. Provides an alphabetized list of abbreviations and acronyms used in this Draft RMP-EIS.

Glossary. Provides definitions of terms used in this Draft RMP-EIS.

References. Provides information for all references cited, most of which are available to the public at libraries or on the Internet. Many of the documents cited are available for public review at JFO.

Appendices. Provide additional supporting information as follows—

- Appendix A—Recreation and Public Purposes Act Lands

- Appendix B—Lands of Uncertain Title
- Appendix C—Relevant Statutes, Regulations, Orders, and Guidelines
- Appendix D—Proposed Conservation Measures and Best Management Practices
- Appendix E—Special Status Species in Alabama and Mississippi
- Appendix F—Soils
- Appendix G—Socioeconomic Figures
- Appendix H—Water Resources
- Appendix I—Withdrawn Lands.
- Appendix J—Summary of the Reasonably Foreseeable Development Scenario

1.8 TOPICS NOT ADDRESSED IN THIS RESOURCE MANAGEMENT PLAN

Laws, regulations, policies, and executive orders require specific resource topics be examined during the NEPA process. In some instances, initial evaluation reveals topics that are not relevant to the planning area or do not require further analysis. These topics that are not addressed in this RMP are listed below.

Native American Concerns. Sites of concern to Native Americans are not known to occur on BLM administered surface lands or FMO in Alabama and Mississippi. Known sites, such as Nanih Waya in Mississippi and Hickory Ground in Alabama, would not be affected by any of the alternatives considered in this plan. Therefore, Native American concerns are not analyzed in detail.

BLM will continue consultation and coordination to identify and consider Native American concerns where future actions might affect cultural or religious values. Consultation with Federally-recognized tribes would take place in accordance with Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, and would occur before planned excavations or undertakings on BLM-administered lands and FMO in compliance with the Native American Graves Protection and Repatriation Act (NAGPRA). BLM would protect and preserve Native American religious and cultural rights and practices on Federal lands in accordance with the American Indian Religious Freedom Act of 1978(AIRFA).

Areas of Critical Environmental Concern (ACEC). There are no designated ACECs within the scope of this plan and no ACECs were proposed internally or externally for designation.

Wilderness. There are no designated or proposed wilderness areas on lands administered by BLM in the planning area.

Minerals Underlying USFS Lands. BLM has the responsibility for lease issuance and post lease administration of 1,640,621 acres of mineral estate where the surface is managed by USFS. However, the RMP will not make decisions on oil and gas leasing of national forest acreage because the Federal Onshore Oil and Gas Reform Act of 1987 requires the USFS to conduct a leasing analysis to make land use planning decisions on oil and gas leasing. This legal requirement does not apply to other Federal surface management agencies. For the purposes of this document, RMP decisions will apply to "BLM-administered non-USFS FMO," which refers to BLM-administered Federal minerals where the surface estate is in non-Federal ownership and Federal agencies excluding USFS.

Locatable and Salable Minerals. There is no reasonable foreseeable development for locatable and salable resources; therefore, such resources in Alabama and Mississippi are not discussed herein. Types of locatable minerals include gold, silver, and copper. Examples of salable minerals include stone, sand, and gravel.

CHAPTER 2—ALTERNATIVES

2.1 INTRODUCTION

Chapter 2 describes the alternatives for a Resource Management Plan (RMP), including the Preferred Alternative, that would guide management of Bureau of Land Management (BLM)-administered lands (referred to as surface tracts) and non-U. S. Forest Service Federal mineral ownership (non-USFS FMO) in Alabama and Mississippi identified in Chapter 1 (Table 1-1 and Table 1-2). An interdisciplinary team developed the alternatives to present a reasonable range of management options for guiding resource management and activities. The management alternatives evaluated in this Draft RMP-Environmental Impact Statement (EIS) were developed to meet resource condition objectives and minimize adverse impacts to cultural and natural resources while providing for compatible resource use and development opportunities consistent with current laws, regulations, and policies.

The National Environmental Policy Act of 1969 (NEPA) requires development and consideration of a reasonable range of management alternatives, including a No Action Alternative. Alternatives must be viable and reasonable; meet the stated purpose and need for the plan; provide a mix of resource protections, management use, and development; be responsive to issues identified during scoping; and meet established planning criteria (outlined in Chapter 1), as well as Federal laws, regulations, and BLM policies. Each management alternative evaluated in the Draft RMP-EIS represents a reasonable approach to managing resources and activities. BLM has the discretion to select an alternative in its entirety or to combine aspects of the various alternatives presented in this draft to develop the Proposed RMP and Final EIS.

2.1.1 How to Read This Chapter

This chapter is divided into four sections:

- **Introduction (Section 2.1)**—presents an overview of the development and consideration of management alternatives and provides direction on How to Read This Chapter (Section 2.1.1).
- **Alternative Components (Section 2.2)**—presents the alternative structure and describes components that are considered for each alternative.
- **Standard Management Common to All Alternatives (Section 2.3)**—describes management actions that are applicable or common to all alternatives.
- **Alternatives Analyzed in Detail (Section 2.4)—**presents four alternatives for management of BLM-administered non-USFS FMO and surface tracts.

2.2 ALTERNATIVE COMPONENTS

Decisions in RMPs guide future land management actions and subsequent site-specific implementation decisions. The RMP alternatives described in this chapter represent approaches to addressing key planning issues (presented in Chapter 1) and to managing resources and resource uses in the planning area. Each alternative comprises two categories of land use planning decisions: (1) desired outcomes for resource management (goals and objectives) and (2) the measures needed to achieve these goals and objectives (allowable uses and management actions). These two categories are discussed below.

- **Desired Outcomes (Goals and Objectives).** Land use plans must identify desired outcomes expressed in terms of specific goals and objectives. Goals and objectives direct BLM's actions in most effectively meeting legal mandates; numerous regulatory responsibilities; national policy; and other resource or social needs. Desired outcomes should be identified for and pertain to resources (such as natural, biological, and cultural), resource uses (such as minerals and lands and realty), and other factors (such as social and economic conditions). Goals are broad statements of desired outcomes (e.g., maintain ecosystem health and productivity, promote community stability, ensure sustainable development) that usually are not quantifiable. Objectives identify specific desired outcomes for resources. Objectives may be quantifiable and measurable and may have established time frames for achievement (as appropriate).

- **Allowable Uses and Management Actions.** After establishing desired outcomes, BLM identifies allowable uses and management actions for different alternatives that are anticipated to achieve the goals and objectives. Land use plans must identify uses, or allocations, that are allowable, restricted, or prohibited on the public lands and mineral estate. These allocations identify surface lands and/or mineral interests where uses are allowed, including any restrictions that may be needed to meet goals and objectives. Land use plans also identify lands where specific uses are excluded to protect resource values. Certain lands may be open or closed to specific uses based on legislative, regulatory, or policy requirements or criteria to protect sensitive resource values. Land use plans must identify the actions anticipated to achieve desired outcomes, including actions to maintain, restore, or improve land health. These actions include proactive measures (e.g., measures that will be taken to enhance watershed function and condition), as well as measures or criteria that will be applied to guide day-to-day activities occurring on public land. Land use plans also establish administrative designations such as areas of critical environmental concern (ACECs), recommend proposed withdrawals, land tenure zones, and recommend or make findings of suitability for congressional designations (such as components of the National Wild and Scenic River System).

Two types of management actions are included in the alternatives in this RMP. The first is standard management common to all alternatives (Section 2.3), which will apply regardless of which alternative is selected. The second is management actions and allowable uses by alternative (Section 2.4), which represent the choice(s) considered across alternatives. Management actions and allowable uses included in this chapter would apply to all BLM-administered surface tracts and non-USFS FMO in the planning area. Although anticipated to achieve desired outcomes, the management actions and allowable uses described in Section 2.4 may not be achieved during the planning period due to limitations in funding or staffing, changing policies or priorities, or new information. These factors could also affect the rate of RMP implementation. It is important to note that the RMP is strategic in nature, and, while it provides an overarching vision for managing resources in the planning area, it must also be flexible to changing priorities, information, and circumstances.

2.3 STANDARD MANAGEMENT COMMON TO ALL ALTERNATIVES

The following standard management would apply regardless of which alternative is selected. These management actions are a result of specific limitations on management of resources and land use programs defined in various laws and regulations that govern BLM management decisions.

2.3.1 Air Quality

Actions authorized on BLM-administered lands and non-USFS FMO would need to be conducted so as to comply with Clean Air Act requirements, including the applicable national Ambient Air Quality Standards (NAAQS) (Section 109); the State Air Quality Implementation Plan (SIP) (Section 110);

control of pollution from Federal facilities (Section 118); prevention of significant deterioration, (PDS) including visibility impacts to mandatory Federal Class I areas (Section 160 et seq.); and conformity analyses and determinations (Section 176(c)). Section 118 of the Clean Air Act requires Federal agencies to comply with all Federal, state, and local air pollution requirements. Section 176(c) prohibits Federal agencies from taking any actions that contribute to a new violation of Ambient Air Quality Standards, increase the frequency or severity of an existing violation, or delay the attainment of a Standard. It also requires Federal agencies to conform to SIPs. BLM policy provides requirements to minimize air quality impacts. For example, prescribed burns must comply with BLM Manual 9214 for air quality maintenance requirements, to minimize air quality impacts from particulates such as smoke.

2.3.2 Soil Resources

Standards and goals under the Clean Water Act (CWA) require measures to minimize non-point source pollution and soil erosion. Measures for minimizing accelerated soil erosion would continue to be made on a site-specific basis through evaluation of management actions and implementation of best management practices (BMPs). Examples of soil BMPs can be found in the *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, Gold Book (BLM 2006)* and at http://www.blm.gov/bmp.

2.3.3 Unique and Prime Farmland

Before any decision authorizing surface disturbance, a determination would be made as to if prime or unique farmland as defined by the Farmland Protection Policy Act (7 U. S.C. 4201 et seq.) is in an area that may be affected by a proposed action. If prime or unique farmland is present, then an appropriate level of analysis would be prepared to determine if the proposed action may have an adverse effect and identify appropriate mitigation measures to minimize any unnecessary and irreversible conversion of farmland to nonagricultural uses.

2.3.4 Water Resources

Standards and goals under the CWA and water quality management objectives developed by the States, as required by the 1987 Water Quality Act Amendments to the Federal Water Pollution Control Act, were created to protect the quality of States' waters and to prevent, abate, and control water pollution. BLM is required to maintain water quality where it presently meets Environmental Protection Agency (EPA)-approved State water quality standards and to improve water quality on public lands where it does not meet standards as defined by Section 303(d) of the CWA. Any water discharged on the surface by industry is controlled through National Pollutant Discharge Elimination System (NPDES) permits. Actions authorized on BLM lands must also comply with the mitigation requirements defined by the Office of Surface Mining regulations for coal leasing and by the U. S. Army Corps of Engineers Section 404 permit requirements. Management actions would be conducted in conformance with the various regulations in the CWA, the State regulations, and the Federal Lands Policy and Management Act of 1976 (FLPMA) to achieve the water quality classifications and standards for surface and ground waters developed by the States.

Management actions would be conducted in a manner conforming to water quality management objectives developed by the States. Standards and goals under the CWA require measures to minimize non-point-source pollution and soil erosion. Measures for minimizing accelerated soil erosion would continue to be made on a site-specific basis through evaluation of management actions and implementation of BMPs. Examples of soil BMPs can be found in the *Surface Operating Standards and*

Guidelines for Oil and Gas Exploration and Development, Gold Book (BLM 2006) and at http://www.blm.gov/bmp.

2.3.5 Vegetative Communities

BLM's role in the management of vegetative communities is to provide habitats that support desired plants and animals. BLM would manage for desired outcomes of vegetative communities, including control of noxious and invasive species, that incorporate the conservation actions identified in the approved state comprehensive conservation strategies. Unless otherwise specified in an alternative, vegetation manipulation, including prescribed burning, mechanical alteration, chemical treatment, manual, and biological would be allowed if needed to meet resource management objectives.

2.3.6 Fish and Wildlife

BLM's role in the management of fish and wildlife is to provide habitats that support desired animal species. BLM would support and coordinate with the State and other partners on habitat improvements and protection in compliance with approved comprehensive State fish and wildlife conservation strategies. This may include actions such as control of invasive plant species, use of prescribed fire, and wetland enhancements. Hunting regulations and game management are under the authority of the State fish and wildlife agency.

2.3.7 Special Status Species

Special status species include all Federal and state-listed species, proposed or candidates for Federal or state listing, and those species identified by BLM as sensitive species. BLM Eastern States policy designates as "BLM sensitive" those additional species that are considered to be critically imperiled (S-1) or imperiled (S-2) by the State Natural Heritage programs.

BLM would avoid jeopardizing the continued existence of any Federally-listed, State-listed, or proposed species; actively promote species recovery; and work to improve the status of candidate and sensitive species. If a Federally-listed species may be affected by a proposed management action, there would be consultation with the U. S. Fish and Wildlife Service (USFWS) pursuant to Section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 United States Code [USC] 1531 *et seq*.). If a proposed management action might impact a State-listed species, there would be consultation with the appropriate State game and fish agency. Harvesting of any sensitive species would be prohibited, except when explicitly authorized for scientific purposes by an appropriate State and/or Federal agency.

If a proposed activity could affect candidate or sensitive species or their habitat, BLM would avoid activities that would contribute to a need to list such species or their habitat. Thus, BLM could require modifications to or reject a proposed activity that could jeopardize the continued existence of a proposed or listed threatened or endangered species, or result in destruction or adverse modification of a designated or proposed critical habitat. BLM would not approve any surface-disturbing activity that may affect any such species or critical habitat until obligations are met under applicable requirements of ESA, as amended, including completion of any required procedure for conference or formal consultation.

2.3.8 Wildland Fire Ecology and Management

Unless a separate, site-specific plan is in place, all wildfires would be suppressed. Agreements, as needed, would be pursued with Federal, State, and local government fire protection agencies for fire suppression.

Prescribed burning would be allowed on a case-by-case basis if needed to meet vegetative communities or fish and wildlife habitat management objectives.

2.3.9 Cultural Resources

Management actions would comply with the National Historic Preservation Act of 1966 (NHPA), as amended (16 USC 470), which provides protection for significant cultural resources. An appropriate level of inventory would be conducted for all actions with a potential to affect these resources, in compliance with the requirements of Section 110 of the NHPA. Actions would require additional consultation with the State Historic Preservation Officer (SHPO), in compliance with Section 106 of NHPA, and/or the Advisory Council on Historic Preservation (36 Code of Federal Regulations [CFR] 800).

Cultural resources would be identified and protected on a case-by-case basis, according to site-specific needs. Any significant sites discovered would be available for scientific, conservation, traditional, or interpretation uses. A site that is not significant (as determined by BLM with SHPO consultation) would be released from management concerns.

2.3.10 Paleontological Resources

Significant paleontological sites are protected under FLPMA. FLPMA charges BLM to (1) manage public land so as to protect the quality of scientific and other values and (2) see that land and resources are periodically and systematically inventoried. Known paleontological resources would be managed according to the BLM 8270 *Handbook* and the BLM *Manual for the Management of Paleontological Resources*.

If discovered, paleontological resources would be managed to protect their important scientific values. Area closures, restrictions, or other mitigation requirements for the protection of paleontological values would be determined on a case-by-case basis. Collecting of scientifically significant vertebrate and invertebrate fossils by qualified paleontologists would be allowed by permit only.

2.3.11 Visual Resources

Because of their small size, the surface tracts are a relatively small component of the visual landscape. Consequently, they have not been the subject of a traditional BLM visual resource management (VRM) inventory and are not assigned VRM classes (defined in Section 3.2.9). Case-by-case processing of land use and mineral development proposals would consider impacts to visual resources where these have been identified as public concerns. All surface tracts would be managed as VRM Class III, except for the Coosa River tracts in Alabama and Hancock County tract in Mississippi, which would be managed as VRM Class II.

2.3.12 Minerals

Federal mineral estate would be available for conveyance to owners of the surface estate as provided in Section 209 of FLPMA. Section 209 provides for this conveyance if there are no known mineral values in the land or if reservation of the mineral rights to the United States is interfering with or precluding appropriate surface development of the land and such development is a more beneficial use of the land. BLM would retain the FMO with known mineral value.

As discussed in Section 1.3, BLM-administered non-USFS FMO in the planning area includes Federal mineral estate underlying lands of BLM or other Federal surface managing agencies (excluding USFS) and split-estate whereby the Federal Government owns all or a portion of the mineral estate but the surface estate is State or privately owned (i.e., non-Federal). BLM-administered non-USFS FMO under the jurisdiction of another Federal surface managing agency would be available for exploration and development as directed by the surface managing agency. Split-estate (i.e., non-USFS FMO underlying private or state-owned surface lands) would be subject to stipulations deemed necessary to protect existing surface improvements or use. BLM would apply stipulations to oil and gas leases as determined through this plan; however, surface management agencies may provide their own stipulations that would be attached to a lease during the lease approval process.

After this plan is approved it is expected that additional FMO tracts will be identified or acquired. If these tracts are similar in resource values and within the environmental issues analyzed in this plan, the new tracts will be managed according to the guidance of this plan and incorporated into the plan through plan maintenance.

Coal leasing potential within the planning area is limited to the Warrior Basin[1] in Alabama because of the distinctive presence of the appropriate geological conditions (e.g., continuity of coalbeds, thickness of coal, quality of coal seams) and existing infrastructure (e.g., existing subsurface mining operations and access roads) for development of coal resources. BLM-administered non-USFS FMO available for coal leasing is located in Walker, Fayette, Jefferson, and Tuscaloosa counties. Coal is also present to a lesser degree in Marion and Winston Counties, but the development of Federal coal in these counties is unlikely. Non-USFS FMO in the Warrior Basin would be available for further coal leasing consideration and limited to underground mining methods. BMPs would be applied as appropriate when processing a Lease by Application (LBA).

2.3.13 Recreation

BLM surface tracts are open to dispersed recreational use, including hunting, fishing, hiking, and nature study. Case-by-case processing of land use and mineral development proposals would consider impacts to recreation where it has been identified as a public concern. Due to the scattered nature of the small surface tracts and lacking recreation interest, special recreation management areas (SRMAs) would not be designated within this RMP and all surface tracts would be managed as extensive recreation management areas (ERMAs).

2.3.14 Lands and Realty

All land use proposals would be evaluated for conformance with plan objectives and land use decisions. Case-by-case processing would include analysis of environmental impacts through the NEPA compliance process. Land disposals would be conducted to meet the requirements identified under applicable authorities. To be considered suitable for disposal through sale, lands must meet the following criteria outlined in Section 203 of the FLPMA:

> (1) such tract because of its location or other characteristics is difficult and uneconomic to manage as part of the public lands, and is not suitable for management by another Federal department or agency
>
> (2) such tract was acquired for a specific purpose and the tract is no longer required for that or any other Federal purpose

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[1] *The term Warrior Basin is a geologic province. The Black Warrior Basin is the drainage area of the Black Warrior River.*

> (3) disposal of such tract will serve important public objectives, including but not limited to, expansion of communities and economic development, which cannot be achieved prudently or feasibly on land other than public land and which outweigh other public objectives and values, including, but not limited to, recreation and scenic values, which would be served by maintaining such tract in Federal ownership.

Lands may be exchanged as authorized by Section 206 of the FLPMA when the exchange would serve the national interest and benefit BLM programs or the programs of other Federal agencies. Lands may be conveyed to State and local government agencies and other qualified organizations under the Recreation and Public Purposes Act of 1926 (R&PP), as amended. Under R&PP, lands may be conveyed or leased only for an established or proposed project for which there are development and management plans, as well as adequate funding by the R&PP applicant to complete the development and a reasonable timetable of development.

Specific surface tracts identified for disposal under the various management alternatives would be evaluated for the presence of significant resource values before such action. Resources to be evaluated would include minerals, recreation, cultural resources, wetlands, and special status species. This evaluation would also be applied before disposal of any additional BLM-administered surface tracts that are identified or verified after approval of the RMP.

Some tracts may have uncertain titles. These are cases in which the tracts are claimed by private owners but government land records show that they were not transferred from Federal ownership. Tracts with uncertain titles would be handled on a case-by-case basis in accordance with the Color-of-Title Act, under which claimants may apply for transfer of these tracts and, if qualified, purchase the tracts to obtain title. Appendix B provides a list of lands of uncertain title occurring within the planning area.

Existing withdrawals (listed in Appendix I) would be subject to review to determine if they are serving their intended purpose. BLM has the authority to revoke, modify, extend, or change withdrawals in accordance with the provisions and limitations of Section 204 of FLPMA.

After this plan is approved it is expected that some additional surface tracts may return to BLM administration after revocation of withdrawals, reversion of R&PP lands and resolution of title. These additional surface tracts will be managed according to applicable guidance of this plan.

This plan does not identify specific utility corridors because of fragmented BLM surface land ownership within the planning area and uncertainties in demand. Right-of-way (ROW) avoidance areas established for protection of sensitive resources and tracts that may be suitable for corridors are identified in the management alternatives presented in Section 2.4. Tracts identified as available for disposal through sale or exchange would be managed as avoidance areas if granting of a ROW might adversely affect tract marketability, unless otherwise specified in the alternatives.

Resolution of unauthorized use would be pursued on a case-by-case basis. Resolution would include termination of use and payment of damages, including reclamation of disturbed land, if needed. In some cases, use may be authorized through ROWs, permits, leases, or land disposal. Valid authorizations would be protected if the land undergoes disposal.

2.3.15 Hazardous Materials

Proposed activities on BLM-administered surface tracts and non-USFS FMO would be evaluated for their potential to release hazardous materials into the environment. Authorized use of hazardous materials must comply with the Resource Conservation and Recovery Act (RCRA). Disposal of hazardous materials is prohibited. Discovery of “unpermitted” hazardous materials would be handled in accordance with the reporting, removal, and remediation requirements of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

2.4 ALTERNATIVES ANALYZED IN DETAIL

This section presents four alternatives for BLM-administered surface tracts and non-USFS FMO. Each alternative represents a direction to guide future management of BLM-administered public lands and resources in Alabama and Mississippi. Alternative 3 was selected as the Preferred Alternative because it protects sensitive resources, while allowing mineral development and providing management efficiency through disposal of most of the scattered surface tracts.

Management themes represented in each alternative include the following:

- **Alternative 1 (No Action)—**represents the No Action Alternative (i.e., continuation of current management). BLM would continue the current management approach by retaining all BLM-administered surface tracts and employing custodial management. BLM management actions would occur in response to an application for use presented by another entity or compliance actions required by regulation and policy (as described in Section 2.3, Standard Management Common to All Alternatives). Potential impacts and mitigation would be identified and assessed when application is made for activity on a specific piece of BLM-administered land.

  There would be 760,570 acres of BLM-administered non-USFS FMO that would be open to oil and gas leasing. Management of oil and gas leasing, exploration, and development would be subject to the standard lease terms and conditions that are included on the lease form.

- **Alternative 2—**proposes that BLM would retain specific BLM-administered surface tracts. BLM would investigate opportunities to manage the tracts in partnership with other agencies or organizations. Use of the tracts would be consistent with management objectives and other land use decisions. Tract-specific constraints for resource uses, such as ROW access, would be based on the presence of sensitive resources (e.g., special status species and important cultural resources). In addition to the management for fish and wildlife habitat, special status species, and cultural resources outlined in Alternative 1, more proactive management would occur on specific tracts to protect important natural and cultural resources. Management actions for specific tracts, as needed, could include installing walkovers and sand fencing on actively used tracts to protect special status species habitat, vegetation treatments to enhance or improve native landscapes on actively used tracts, and habitat management to achieve objectives in established fish and wildlife conservation strategies.

  There would be 760,452 acres of BLM-administered non-USFS FMO that would be open to oil and gas leasing; since an additional 365 acres would be closed to protect habitat of the Federally-listed Alabama beach mouse. In addition to standard terms and conditions, conservation measures would be applied as stipulations to oil and gas leases and BMPs would be used to reduce adverse effects caused surface-disturbing or disruptive activities associated with oil and gas operations on BLM-administered non-USFS FMO. Conservation measures, including no surface occupancy (NSO), controlled surface use (CSU), seasonal stipulations, and BMPs are presented in Appendix D. Under this alternative, lease stipulations would include a 1,000-feet NSO buffer from aquatic habitats and Alabama beach mouse habitat would not be available for lease. The stipulations in Appendix D would be applied in addition to the standard lease terms and conditions on the lease form. For each stipulation there are provisions for waiver, modification, and exception provided in Appendix D, which could be applied as appropriate. The BMPs would be considered mandatory to reduce adverse impacts to specific resources and would be applied to oil and gas operations on new and existing leases. There would be some flexibility in implementation of each BMP, depending on site-specific conditions. Where there is potential to affect Federally-listed, proposed, or candidate species or designated critical habitat, application of BMPs and/or waiver, modification and exception to stipulations would normally require coordination and possible formal consultation with USFWS.

- **Alternative 3 (Preferred Alternative)—**All of the BLM-administered surface tracts would be available for disposal except the Hancock County tract in Mississippi. For some of the surface tracts, there would be conditions placed on the disposal that development and use of the tract would be consistent with the resource management objectives and allowable uses established for the tract. Restrictions on use after disposal would be provided in the patent transferring ownership. Valid existing rights and other valid authorizations would be protected if disposal occurred.

  Until the surface tracts are disposed, management would apply tract-specific constraints for resource uses, such as ROW access, based on the presence of sensitive resources (e.g., special status species and important cultural resources). In addition to the management for fish and wildlife habitat, special status species, and cultural resources outlined in Alternative 1, more proactive management would occur on specific tracts to protect important natural and cultural resources. Management actions for specific tracts, as needed, could include vegetation treatments to enhance or improve native landscapes on actively used tracts and habitat management to achieve objectives in established fish and wildlife conservation strategies.

  There would be 760,570 acres of BLM-administered non-USFS FMO that would be open to oil and gas leasing. Similar to Alternative 2, Alternative 3 uses conservation measures that would be applied as lease stipulations and BMPs to reduce adverse effects caused by surface-disturbing or disruptive activities associated with oil and gas operations on BLM-administered non-USFS FMO. The stipulations in Alternative 3 are different from Alternative 2 in two ways. First, Alabama beach mouse habitat would be available for lease, subject to a NSO stipulation. Second, the buffer from aquatic habitats would be reduced to 250 feet.

- **Alternative 4—**Alternative 4 proposes that all BLM-administered surface tracts would be made available for disposal from Federal ownership with no specific condition on use after disposal. Valid existing rights and other valid authorizations would be protected in the event of disposal. Under this alternative, management of BLM-administered non-USFS FMO would be the same as Alternative 3.

2.4.1 Management of Non-Forest Service Federal Mineral Ownership

The discussion of proposed management of mineral leasing and development of BLM-administered non-USFS FMO presented in this section is limited to oil and gas leasing. Non-USFS FMO includes mineral ownership underlying BLM-administered surface tracts. Proposed management for coal leasing is presented in Section 2.3, Standard Management Common to All Alternatives. Where non-USFS FMO is concerned, decisions of this RMP will pertain only to BLM's role in administering the minerals.

Alternatives 1 through 4 were developed to present a reasonable range of options for where leasing can occur to guide decision making for managing mineral leasing and development. There are four oil and gas leasing categories:

- **Open to leasing, subject to standard lease terms and conditions**—includes areas in which standard lease terms and conditions are determined to be sufficient to protect other land uses or resource values.
- **Open to leasing, subject to minor constraints**—comprises areas in which moderately restrictive lease stipulations such as timing limitations or distance setbacks are required to mitigate impacts to other land uses or resource values. Such constraints are often referred to as CSU.
- **Open to leasing, subject to major constraints**—encompasses areas in which highly restrictive lease stipulations, such as NSO, are required to mitigate impacts to other land uses or resource values.
- **Closed to leasing**—is designated for areas where other land uses or resource values cannot be adequately protected with even the most restrictive lease stipulations. Appropriate protection can be ensured only by closing the lands to leasing.

The acreage of BLM-administered non-USFS FMO available for oil and gas leasing in Alabama and Mississippi by alternative is shown in Table 2-1 and Table 2-2. Federal oil and gas leases contain standard lease terms that are included on the lease form, many of which are designed to protect natural resources. As described above, special stipulations can be attached to a lease to respond to specific environmental or resource concerns for a particular lease area. Special stipulations are developed during the land use planning process, such as this RMP. Stipulations are attached to and made part of the lease and modify standard lease terms or the manner in which operations may be conducted. The variation of acreage by alternative for leasing stipulations associated with oil and gas potential in Alabama and Mississippi is shown in Table 2-3 and Table 2-4. Conservation measures, including stipulations and BMPs, are provided in Appendix D.

Reasonably Foreseeable Development Scenario for Minerals

Alabama and Mississippi have been classified as having high occurrence potential for oil and gas resources, based on the reasonably foreseeable development scenario (RFDS) prepared by BLM. It is estimated that 20 wells would be drilled on non-USFS FMO in Alabama and 10 wells would be drilled on non-USFS FMO in Mississippi over the next 20 years (BLM Mineral Report 2005). These actions are expected to disturb a total of 105 acres in Alabama and 55 acres in Mississippi.

Table 2-1. Oil and Gas Leasing Categories in Alabama by Alternative

Oil and Gas Leasing Category	Alternative 1 (No Action) (Acres)	Alternative 2 (Acres)	Alternative 3 (Preferred) (Acres)	Alternative 4 (Acres)
Open to leasing, subject to standard lease terms and conditions	305,640	119,231	144,895	144,895
Open to leasing, subject to minor constraints	0	91,702	117,506	117,506

Oil and Gas Leasing Category	Alternative 1 (No Action) (Acres)	Alternative 2 (Acres)	Alternative 3 (Preferred) (Acres)	Alternative 4 (Acres)
Open to leasing, subject to major constraints	0	94,589	43,239	43,239
Closed to leasing	8,179	8,297	8,179	8,179
TOTAL	**313,819** [a]	**313,819** [a]	**313,819** [a]	**313,819** [a]

Notes:
a Represents all BLM-administered non-USFS FMO within the State of Alabama.

Table 2-2. Oil and Gas Leasing Categories in Mississippi by Alternative

Oil and Gas Leasing Category	Alternative 1 (No Action) (Acres)	Alternative 2 (Acres)	Alternative 3 (Preferred) (Acres)	Alternative 4 (Acres)
Open to leasing, subject to standard lease terms and conditions	454,930	270,615	359,640	359,640
Open to leasing, subject to minor constraints	0	123	3,021	3,021
Open to leasing, subject to major constraints	0	184,192	92,269	92,269
Closed to leasing	63,004	63,004	63,004	63,004
TOTAL	**517,934** [a]	**517,934** [a]	**517,934** [a]	**517,934** [a]

Notes:
a Represents all BLM-administered non-USFS FMO within the State of Mississippi.

Table 2-3. Leasing Stipulations in Alabama by Alternative [a]

Area	Total non-Forest Service Federal Mineral Ownership (Acres) [a, b]
ALTERNATIVE 1 (NO ACTION)	
NO LEASE	
Other Surface Management Agency Lands	
USFWS	3,384
Department of Defense (DoD) (Maxwell Air Force Base)	1,495
National Park Service (NPS)	3,300

Area	Total non-Forest Service Federal Mineral Ownership (Acres) [a, b]
Total Affected Area (in acres) [b]	**8,179**
NO SURFACE OCCUPANCY/NO SURFACE DISTURBANCE	
Total Affected Area (in acres) [b]	**0**
CONTROLLED SURFACE USE	
Total Affected Area (in acres) [b]	**0**
SEASONAL LIMITATIONS	
Total Affected Area (in acres) [b]	**0**
OPEN TO LEASING SUBJECT TO STANDARD LEASE TERMS AND CONDITIONS	
Total Affected Area (in acres) [b]	**305,640**
ALTERNATIVE 2	
NO LEASE	
Other Surface Management Agency Lands	
USFWS	3,384
DoD (Maxwell Air Force Base)	1,495
NPS	3,300
Alabama beach mouse suitable habitat or Federally-designated critical habitat	365
Total Affected Area (in acres) [b]	**8,544**
NO SURFACE OCCUPANCY/NO SURFACE DISTURBANCE	
Bald eagle nests (1,500-ft. buffer around active or inactive nests and communal roost sites)	30
Red-cockaded woodpecker (0.5 mile of a cluster plus a 200-ft. buffer zone surrounding that area)	888
Sea turtle suitable nesting habitat (100-ft. buffer from the mean high tide line of coastal beaches)	513
Gray bat, Indiana bat, Alabama cave shrimp, Alabama cave fish (600-ft. buffer around caves, fractures, large sinkholes or 250-ft. buffer around perennial or intermittent streams in or adjacent to counties with documented populations)	12,898
Gray bat or Indiana bat summer roost or gray bat wintering cave hibernacula (0.5-mile buffer)	3,044
Freshwater aquatic species (1,000-ft. buffer around river, stream, wetland spring, headwaters, wet meadows, wet pine savannas, pond, tributary, lake, coastal slough, sand bars, vernal pools on granite outcrops, calcareous seepage marshes, or small, marshy calcareous streams)	90,930
Piping plover/least tern habitat (from the debris rack line to the low tide line of coastal beaches)	2,131
Total Affected Area (in acres) [b]	**110,434**
CONTROLLED SURFACE USE	
Bald eagle nests (no tree removal within 1.5-mile buffer zone around active or inactive bald eagle nests and communal roost sites)	848
Gopher tortoise burrow (600-ft. buffer)	ND

Area	Total non-Forest Service Federal Mineral Ownership (Acres) [a, b]
Gray bat/Indiana bat hibernacula (1.5-mile buffer)	11,573
Identified karstic habitat or any hydrologic network connected to caves used by listed bat species or other listed cave species	112,368
Sensitive plant species habitat	103
Total Affected Area (in acres) [b]	**96,871**
SEASONAL LIMITATIONS	
Bald eagle nest or communal roosting sites (timing restriction within 1.5 miles between December 1 and August 1)	1,299
Total Affected Area (in acres) [b]	**1,299**
OPEN TO LEASING SUBJECT TO STANDARD LEASE TERMS AND CONDITIONS	
Total Affected Area (in acres) [b]	**119,231**
ALTERNATIVE 3 (PREFERRED ALTERNATIVE) and ALTERNATIVE 4	
NO LEASE	
Other Surface Management Agency Lands	
USFWS	3,384
DoD (Maxwell Air Force Base)	1,495
NPS	3,300
Total Affected Area (in acres) [b]	**8,179**
NO SURFACE OCCUPANCY/NO SURFACE DISTURBANCE	
Bald eagle nests (1,500-ft. buffer around active or inactive nests and communal roost sites)	30
Red-cockaded woodpecker (0.5 mile of a cluster plus a 200-ft. buffer zone surrounding that area)	888
Sea turtle suitable nesting habitat (100-ft. buffer from the mean high tide line of coastal beaches)	513
Alabama beach mouse suitable habitat or Federally designated critical habitat	365
Gray bat, Indiana bat, Alabama cave shrimp, Alabama cave fish (600-ft buffer around caves, fractures, large sinkholes or 250-ft. buffer around perennial or intermittent streams in or adjacent to counties with documented populations)	12,898
Gray bat or Indiana bat summer roost or gray bat wintering cave hibernacula (0.5-mile buffer)	3,044
Freshwater aquatic species (250-ft.buffer around river, stream, wetland spring, headwaters, wet meadows, wet pine savannas, pond, tributary, lake, coastal slough, sand bars, vernal pools on granite outcrops, calcareous seepage marshes, or small, marshy calcareous streams; buffer may be extended up to 600 ft. if slope exceeds 10%)	38,111
Piping plover/least tern habitat (from the debris rack line to the low tide line of coastal beaches)	2,131
Total Affected Area (in acres) [b]	**58,049**

Area	Total non-Forest Service Federal Mineral Ownership (Acres) [a, b]
CONTROLLED SURFACE USE	
Bald eagle nests (no tree removal within 1.5-mile buffer zone around active or inactive bald eagle nests and communal roost sites)	848
Gopher tortoise burrow (600-ft. buffer)	ND
Gray bat/Indiana bat hibernacula (1.5-mile buffer)	11,573
Identified karstic habitat or any hydrologic network connected to caves used by listed bat species or other listed cave species	112,368
Sensitive plant species habitat	103
Total Affected Area (in acres) [b]	**125,044**
SEASONAL LIMITATIONS	
Bald eagle nest or communal roosting sites (timing restriction within 1.5 miles between December 1 and August 1)	1,299
Total Affected Area (in acres) [b]	**1,299**
OPEN TO LEASING SUBJECT TO STANDARD LEASE TERMS AND CONDITIONS	
Total Affected Area (in acres) [b]	**144,895**

Notes:
a All Federal mineral estate in Alabama has high potential for oil and gas resources.
b Total acres under each alternative do not represent accurate totals shown in Table 2-1 because of the overlap of land resources and land use restrictions.
ND No habitat data available to estimate affected area.

Table 2-4. Leasing Stipulations in Mississippi by Alternative [a]

Area	Total non-Forest Service Federal Mineral Ownership (Acres) [a,b]
ALTERNATIVE 1 (NO ACTION)	
NO LEASE	
Other Surface Management Agency Lands	
USFWS	60,207
NPS	2,797
Total Affected Area (in acres) [b]	**63,004**
NO SURFACE OCCUPANCY/NO SURFACE DISTURBANCE	
Total Affected Area (in acres) [b]	**0**
CONTROLLED SURFACE USE	
Total Affected Area (in acres) [b]	**0**
SEASONAL LIMITATIONS	
Total Affected Area (in acres) [b]	**0**
OPEN TO LEASING SUBJECT TO STANDARD LEASE TERMS AND CONDITIONS	
Total Affected Area (in acres) [b]	**454,930**

Area	Total non-Forest Service Federal Mineral Ownership (Acres) [a,b]
ALTERNATIVE 2	
NO LEASE	
Other Surface Management Agency Lands	
USFWS	60,207
NPS	2,797
Total Affected Area (in acres) [b]	**63,004**
NO SURFACE OCCUPANCY/NO SURFACE DISTURBANCE	
Hancock County Marsh	1,810
Bald eagle nests (1,500-ft. buffer around active or inactive nests and communal roost sites)	1,089
Red-cockaded woodpecker (0.5 mile of a cluster plus a 200-ft. buffer zone surrounding that area)	11,710
Sea turtle suitable nesting habitat (100-ft. buffer from the mean high tide line of coastal beaches)	997
Gray bat, Indiana bat (600-ft. buffer around caves, fractures, sinkholes or 250-ft. buffer around perennial or intermittent streams in or adjacent to counties with documented populations)	2,564
Gray bat or Indiana bat summer roost or gray bat wintering cave hibernacula (0.5-mile buffer)	7,073
Freshwater aquatic species (1,000-ft. buffer around river, stream, wetland spring, headwaters, wet meadows, wet pine savannas, pond, tributary, lake, coastal slough, sand bars, vernal pools on granite outcrops, calcareous seepage marshes, or small, marshy calcareous streams)	168,383
Louisiana black bear (1,500-ft. buffer around den trees in occupied bottomland hardwood and floodplain forest habitats)[c]	ND
Piping plover/least tern habitat (from the debris rack line to the low tide line of coastal beaches)	4,237
Total Affected Area (in acres) [b]	**197,863**
CONTROLLED SURFACE USE	
Bald eagle nests (no tree removal within 1.5-mile buffer zone around active or inactive bald eagle nests and communal roost sites)	8,917
Gopher tortoise burrow (600-ft. buffer)	122
Gray bat/Indiana bat hibernacula (1.5-mile buffer)	1
Identified karstic habitat or any hydrologic network connected to caves used by listed bat species or other listed cave species	ND
Sensitive plant species habitat	ND
Total Affected Area (in acres) [b]	**9,040**
SEASONAL LIMITATIONS	
Bald eagle nest or communal roosting sites (timing restriction within 1.5 miles between December 1 and August 1)	13,742
Total Affected Area (in acres) [b]	**13,742**

Area	Total non-Forest Service Federal Mineral Ownership (Acres) [a,b]
OPEN TO LEASING SUBJECT TO STANDARD LEASE TERMS AND CONDITIONS	
Total Affected Area (in acres) [b]	**270,615**
ALTERNATIVE 3 (PREFERRED ALTERNATIVE) AND ALTERNATIVE 4	
NO LEASE	
Other Surface Management Agency Lands	
USFWS	60,207
NPS	2,797
Total Affected Area (in acres) [b]	**63,004**
NO SURFACE OCCUPANCY/NO SURFACE DISTURBANCE	
Hancock County Marsh	1,810
Bald eagle nests (1,500-ft. buffer around active or inactive nests and communal roost sites)	1,089
Red-cockaded woodpecker (0.5 mile of a cluster plus a 200-ft. buffer zone surrounding that area)	11,710
Sea turtle suitable nesting habitat (100-ft. buffer from the mean high tide line of coastal beaches)	997
Gray bat, Indiana bat (600-ft. buffer around caves, fractures, sinkholes or 250-ft. buffer around perennial or intermittent streams in or adjacent to counties with documented populations)	2,564
Gray bat or Indiana bat summer roost or gray bat wintering cave hibernacula (0.5-mile buffer)	7,073
Freshwater aquatic species (250-ft. buffer around river, stream, wetland spring, headwaters, wet meadows, wet pine savannas, pond, tributary, lake, coastal slough, sand bars, vernal pools on granite outcrops, calcareous seepage marshes, or small, marshy calcareous streams; buffer may be extended up to 600 ft. if slope exceeds 10%)	68,656
Louisiana black bear (1,500-ft. buffer around den trees in occupied bottomland hardwood and floodplain forest habitats)[c]	ND
Piping plover/least tern habitat (from the debris rack line to the low tide line of coastal beaches)	4,237
Total Affected Area (in acres) [b]	**98,136**
CONTROLLED SURFACE USE	
Bald eagle nests (no tree removal within 1.5-mile buffer zone around active or inactive bald eagle nests and communal roost sites)	8,917
Gopher tortoise burrow (600-ft. buffer)	122
Gray bat/Indiana bat hibernacula (1.5-mile buffer)	1
Identified karstic habitat or any hydrologic network connected to caves used by listed bat species or other listed cave species	ND
Sensitive plant species habitat	ND
Total Affected Area (in acres) [b]	**9,040**

Area	Total non-Forest Service Federal Mineral Ownership (Acres) [a,b]
SEASONAL LIMITATIONS	
Bald eagle nest or communal roosting sites (timing restriction within 1.5 miles between December 1 and August 1)	13,742
Total Affected Area (in acres) [b]	**13,742**
OPEN TO LEASING SUBJECT TO STANDARD LEASE TERMS AND CONDITIONS	
Total Affected Area (in acres) [b]	**359,640**

Notes:

a All Federal mineral estate in Mississippi has high potential for oil and gas resources.

b Total acres under each alternative do not represent accurate totals shown in Table 2-2 because of the overlap of land resources and land use restrictions.

c No habitat data available to estimate affected area. No surface disturbance, including removal of potential den trees, is permitted within a 1,500-foot buffer around den trees in occupied bottomland hardwood and floodplain forest habitats.

ND No habitat data available to estimate affected area.

2.4.2 Management of Surface Tracts

For the purposes of this plan, the surface tracts were grouped on the basis of geographic proximity and similar management needs. The surface tract groups to be discussed in this section include the Coosa River Tracts, Fort Morgan Beach Tracts, Fort Morgan Highway Tracts, Fowl River Tract, Geneva Tract, and Jordan Lake Tract in Alabama and the Hancock County Tract in Mississippi. These surface tracts and their associated acreage, county, and legal description are listed in Table 2-5. Proposed planning decisions for each surface tract grouping, by alternative, are detailed in Table 2-6 – Table 2-12. These tables are accompanied by maps depicting the tract locations (Maps 2-1 – 2-7).

Table 2-5. Surface Tracts in Alabama and Mississippi

Name of Tract Group	Acres	County	Legal Description[a]
Alabama			
Coosa River Tracts			
			St. Stephens Meridian
Foshee Islands	9.58	Coosa	T. 22N, R. 16E, Sec. 5, Lots 1, 2, & 5
	3.25	Coosa	T. 22N, R. 16E, Sec. 8, Lot 1
Little Rock Island	0.45	Coosa	T. 22N, R. 16E, Sec. 5, Lot 3
Big Rock Island	6.09	Coosa	T. 22N, R. 16E, Sec. 5, Lot 4
Gilchrist Island	4.38	Coosa	T. 23N, R. 16E, Sec. 32, Lot C
			Huntsville Meridian
Unnamed Island	0.07	Calhoun	T. 14S, R. 5E, Sec. 24, Lot 2
Smith Island	5.58	Shelby	T. 20S, R. 2E, Sec. 24, Lot 1
Prince Island	12.74	Talladega	T. 20S, R. 2E, Sec. 24, Lot 2
			T. 20S, R. 2E, Sec. 13, Lot 1
			T. 20S, R. 3E, Sec. 18, Lot 1
Total Acreage of Tract Group	**42.14**		

Name of Tract Group	Acres	County	Legal Description[a]
Fort Morgan Beach Tracts			
			St. Stephens Meridian
Fort Morgan Beach Tract	0.84	Baldwin	T. 9S, R. 1E, Sec. 25, Lot 24
Fort Morgan Beach Tract	5.32	Baldwin	T. 9S, R. 1E, Sec. 26, Lots 13 &14
Fort Morgan Beach Tract	10.60	Baldwin	T. 9S, R. 2E, Sec. 27, Lots 54 & 55
Fort Morgan Beach Tract	11.94	Baldwin	T. 9S, R. 2E, Sec. 25, Lots 73 & 74
Total Acreage of Tract Group	**28.70**		
Fort Morgan Highway Tracts			
			St. Stephens Meridian
Fort Morgan Highway Tract	20.16	Baldwin	T. 9S, R. 1E, Sec. 25, Lot 5
			T. 9S, R. 1E, Sec. 26, Lot 15
Fort Morgan Highway Tract	8.88	Baldwin	T. 9S, R. 2E, Sec. 28, Lot 43
Fort Morgan Highway Tract	12.24	Baldwin	T. 9S, R. 2E, Sec. 27, Lot 56
			T. 9S, R. 2E, Sec. 28, Lot 44
Total Acreage of Tract Group	41.28		
Fowl River Tract			
			St. Stephens Meridian
Fowl River Tract	41.73	Mobile	T. 7S, R. 2W, Sec. 25, Lots 2–5
Geneva County Tract			
			Tallahassee Meridian
East Fork Choctawhatchee River Tract	0.95	Geneva	T. 7N, R. 16W, Sec. 22, Lot 4
Jordan Lake Tract			
			St. Stephens Meridian
Jordan Lake Tract	4.3	Chilton	T. 21N, R. 16E, Sec. 14, Lot 1
Total Surface Estate in Alabama	**159.10**		
Mississippi			
Hancock County Tract			
			St. Stephens Meridian
Hancock County	174.25	Hancock	T. 9S, R. 15W, Sec. 25, Lots 2, 3, 4, 5, SESE
Total Surface Estate in Mississippi	**174.25**		

[a] The legal description is abbreviated according to a rectangular survey system in which T. 22N, R. 16E, Sec. 5, Lot 1 means that the area is located at Lot 1 of Section 5 in Township 22 North, Range 16 East, in the meridian specified above. Townships are divided into 36 numbered sections. A standard section comprises 1 square mile or 640 acres of land and consists of aliquot parts of sections (e.g., half section of 320 acres, quarter section of 160 acres, 16th section of 40 acres). The township number indicates how far in a given direction (north or south) of a surveyed parallel the township is located. The range number indicates how far in a given direction (east or west) of a surveyed meridian the township is located

Table 2-6. Alternatives for Coosa River Tracts (Maps 2-1a, 2-1b, 2-1c)

<table>
<tr><th>Alternative 1
(No Action)</th><th>Alternative 2</th><th>Alternative 3
(Preferred)</th><th>Alternative 4</th></tr>
<tr><td colspan="4">Vegetative Communities</td></tr>
<tr><td colspan="4">Management Goals and Objectives</td></tr>
<tr><td colspan="4">Manage vegetative communities to protect, preserve, or enhance Federally-listed and other special status plant species and imperiled plant communities.</td></tr>
<tr><td colspan="4">Control noxious and invasive plant species.</td></tr>
<tr><td>No specific management goals and objectives are proposed.</td><td colspan="2">Protect mature stands of mixed hardwood/pine overstory and a diversity of understory species.</td><td>No specific management goals and objectives are proposed.</td></tr>
<tr><td colspan="4">Allowable Uses and Management Actions</td></tr>
<tr><td rowspan="2">No specific actions are proposed.</td><td colspan="2">Remove invasive species, such as mimosa (<i>Albizia julibrissin Durazz L.</i>) by hand and with selective, hand application of herbicide.</td><td rowspan="2">No specific actions are proposed.</td></tr>
<tr><td colspan="2">Conduct baseline inventories for special status plants.</td></tr>
<tr><td colspan="4">Fish and Wildlife Habitat</td></tr>
<tr><td colspan="4">Management Goals and Objectives</td></tr>
<tr><td colspan="4">Manage vegetative communities to protect, preserve, or enhance Federally-listed and other special status fish and wildlife species and their habitat.</td></tr>
<tr><td colspan="4">Allowable Uses and Management Actions</td></tr>
<tr><td>No specific actions are proposed.</td><td colspan="2">Monitor fledgling success of active bald eagle nests.</td><td>No specific actions are proposed.</td></tr>
<tr><td colspan="4">Minerals</td></tr>
<tr><td colspan="4">Management Goals and Objectives</td></tr>
<tr><td colspan="4">Provide for leasing, exploration, and development of BLM-administered non-USFS FMO, while protecting other resource values.</td></tr>
<tr><td colspan="4">Allowable Uses and Management Actions</td></tr>
<tr><td>The tracts would be open to leasing, subject to standard lease terms and conditions.</td><td>The tracts would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation of a 1,000-ft. buffer from aquatic habitats, and stipulations to protect bald eagle nesting and roosting habitat, as described in Appendix D.</td><td colspan="2">The tracts would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation of a 250-ft. buffer from aquatic habitats, and stipulations to protect bald eagle nesting and roosting habitat, as described in Appendix D.</td></tr>
<tr><td colspan="4">Recreation and Travel Management</td></tr>
<tr><td colspan="4">Management Goals and Objectives</td></tr>
<tr><td colspan="4">Allow recreation use and travel compatible with other resource management objectives.</td></tr>
<tr><td colspan="4">Support water-based recreation opportunities consistent with the Coosa River Recreation Plan (Federal Energy Regulatory Commission [FERC] Project Nos. 2146, 082 and 618).</td></tr>
</table>

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
Allowable Uses and Management Actions			
The tracts would remain open to recreation use.	The tracts would be open to recreation use including fishing, picnicking, rest stops of boaters and canoeists, and wildlife observation.		
The tracts would remain open to motorized vehicle use.	The tracts would be designated as closed.		
Lands and Realty			
Management Goals and Objectives			
Manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values.			
Make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.			
Allowable Uses and Management Actions			
The tracts would be retained by BLM.	The tracts would be retained by BLM. BLM would pursue opportunities to manage the tracts in partnership with other agencies and organizations.	The tracts would be available for disposal under the condition that uses would be consistent with the resource management goals and objectives and allowable uses and management actions established under this alternative. In the case of R&PP conveyance, use after disposal would be controlled through approval of and compliance with the plan of development. In the case of FLPMA disposal (e.g., sale), restrictive covenants would be required to protect sensitive resources.	The tracts would be available for disposal from Federal ownership with no restrictive covenants. Disposal may not be allowed if they would jeopardize Federally-listed species. Land exchanges to benefit Federally-listed species would be permitted.
The tracts would remain open to ROW applications.	These island tracts would be avoidance areas for ROWs to protect native vegetative communities and adjacent aquatic habitat.		

Map 2-1a

Alabama and Mississippi RMP-EIS

Coosa River Tracts (42.14 total acres)
Unamed Island (0.07 acres)
Calhoun County, AL

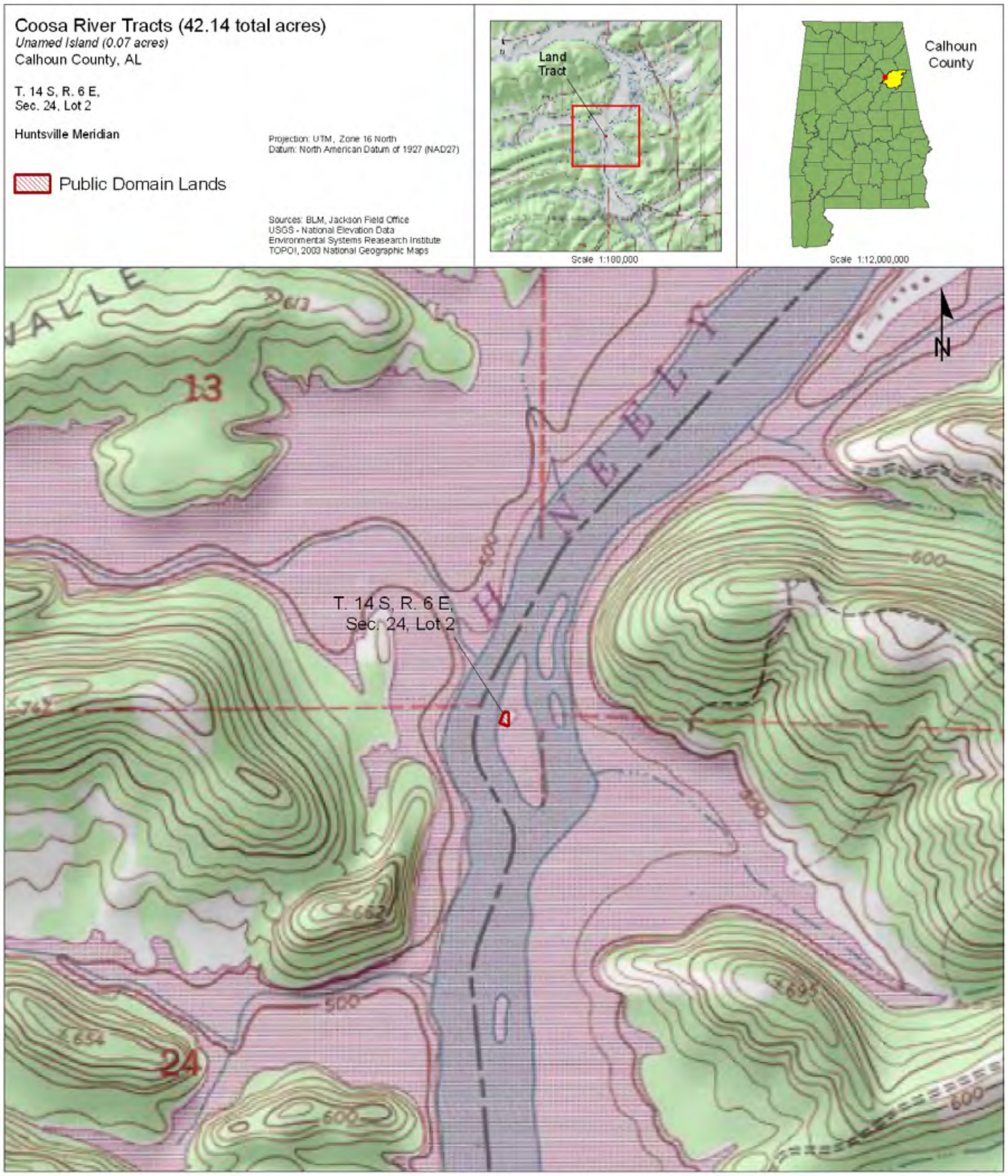
T. 14 S, R. 6 E,
Sec. 24, Lot 2

Huntsville Meridian

▨ Public Domain Lands

Projection: UTM, Zone 16 North
Datum: North American Datum of 1927 (NAD27)

Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Reasearch Institute
TOPO!, 2003 National Geographic Maps

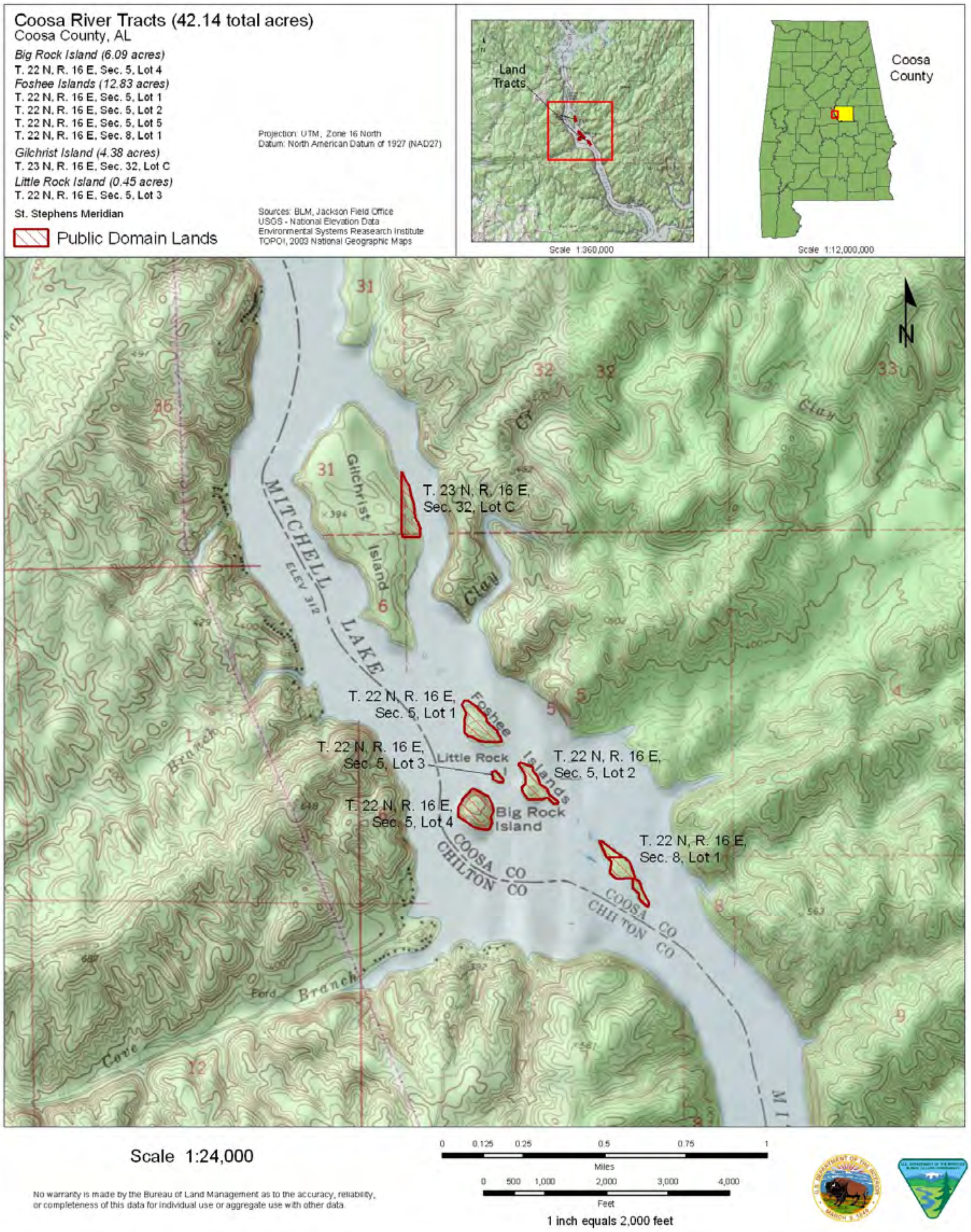


Scale 1:12,000

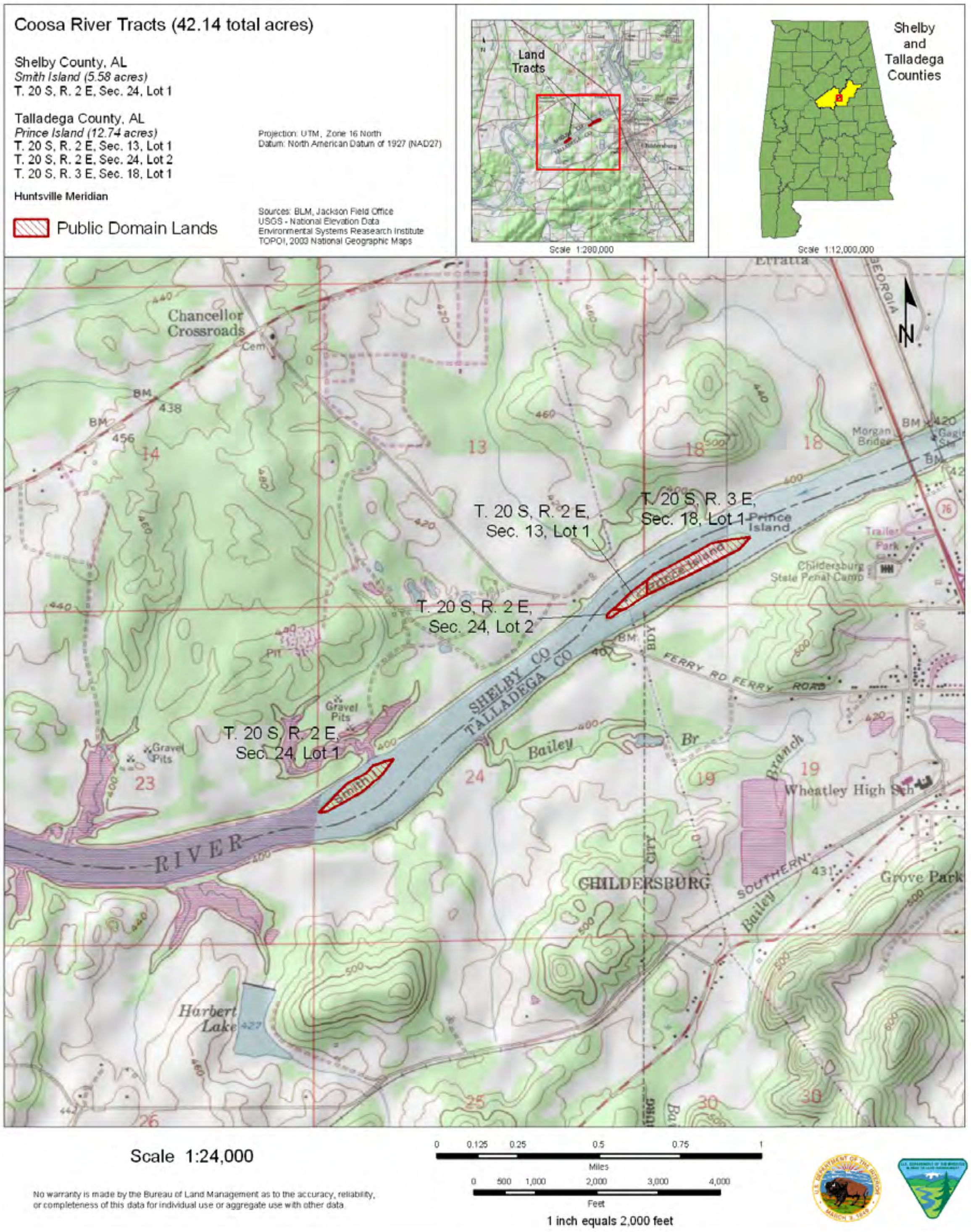
1 inch equals 1,000 feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

Map 2-1b
Alabama and Mississippi RMP-EIS


Coosa River Tracts (42.14 total acres)
Coosa County, AL
Big Rock Island (6.09 acres)
T. 22 N, R. 16 E, Sec. 5, Lot 4
Foshee Islands (12.83 acres)
T. 22 N, R. 16 E, Sec. 5, Lot 1
T. 22 N, R. 16 E, Sec. 5, Lot 2
T. 22 N, R. 16 E, Sec. 5, Lot 5
T. 22 N, R. 16 E, Sec. 8, Lot 1
Gilchrist Island (4.38 acres)
T. 23 N, R. 16 E, Sec. 32, Lot C
Little Rock Island (0.45 acres)
T. 22 N, R. 16 E, Sec. 5, Lot 3
St. Stephens Meridian
▨ Public Domain Lands
Projection: UTM, Zone 16 North
Datum: North American Datum of 1927 (NAD27)
Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Reasearch Institute
TOPO!, 2003 National Geographic Maps
Land Tracts
Scale 1:360,000
Coosa County
Scale 1:12,000,000
N
T. 23 N, R. 16 E, Sec. 32, Lot C
T. 22 N, R. 16 E, Sec. 5, Lot 1
T. 22 N, R. 16 E, Sec. 5, Lot 3
T. 22 N, R. 16 E, Sec. 5, Lot 2
T. 22 N, R. 16 E, Sec. 5, Lot 4
T. 22 N, R. 16 E, Sec. 8, Lot 1
Gilchrist Island
Foshee Islands
Little Rock
Big Rock Island
MITCHELL LAKE
ELEV 312
COOSA CO
CHILTON CO
Clay Cr
Ford Branch
Cove
Branch
31
32
33
36
6
5
4
1
12
8
9
Scale 1:24,000
0 0.125 0.25 0.5 0.75 1
Miles
0 500 1,000 2,000 3,000 4,000
Feet
1 inch equals 2,000 feet
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

Map 2-1c
Alabama and Mississippi RMP-EIS



Coosa River Tracts (42.14 total acres)

Shelby County, AL
Smith Island (5.58 acres)
T. 20 S, R. 2 E, Sec. 24, Lot 1

Talladega County, AL
Prince Island (12.74 acres)
T. 20 S, R. 2 E, Sec. 13, Lot 1
T. 20 S, R. 2 E, Sec. 24, Lot 2
T. 20 S, R. 3 E, Sec. 18, Lot 1

Huntsville Meridian

▨ Public Domain Lands

Projection: UTM, Zone 16 North
Datum: North American Datum of 1927 (NAD27)

Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Reasearch Institute
TOPO!, 2003 National Geographic Maps

Scale 1:24,000

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

1 inch equals 2,000 feet

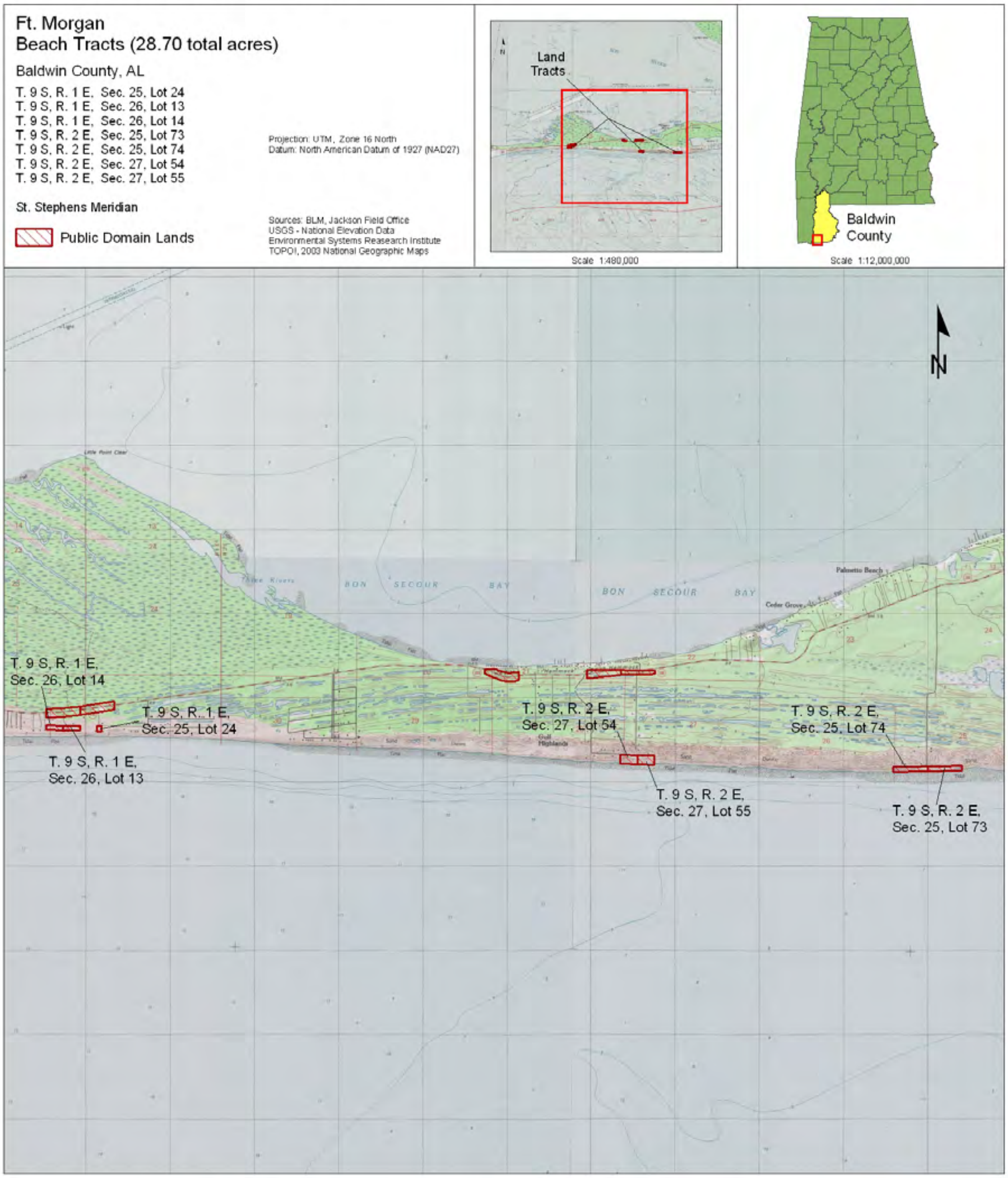
Table 2-7. Alternatives for Fort Morgan Beach Tracts (Map 2-2)

<table>
<thead>
<tr><th>Alternative 1 (No Action)</th><th>Alternative 2</th><th>Alternative 3 (Preferred)</th><th>Alternative 4</th></tr>
</thead>
<tbody>
<tr><td colspan="4">Vegetative Communities</td></tr>
<tr><td colspan="4">Management Goals and Objectives</td></tr>
<tr><td colspan="4">Manage vegetative communities to protect, preserve, or enhance Federally-listed and other special status plant species and imperiled plant communities.</td></tr>
<tr><td colspan="4">Control noxious and invasive plant species.</td></tr>
<tr><td colspan="4">Allowable Uses and Management Actions</td></tr>
<tr><td rowspan="2">No specific actions proposed.</td><td colspan="2">Promote establishment and retention of native coastal dune vegetative communities by planting native species and installing sand fence to protect existing dune habitat.</td><td rowspan="2">No specific actions are proposed.</td></tr>
<tr><td colspan="2">Control invasive species through hand pulling, as needed.</td></tr>
<tr><td colspan="4">Fish and Wildlife Habitat</td></tr>
<tr><td colspan="4">Management Goals and Objectives</td></tr>
<tr><td colspan="4">Manage vegetative communities to protect, preserve, or enhance Federally-listed and other special status fish and wildlife species and their habitat.</td></tr>
<tr><td>No specific management goals and objectives are proposed.</td><td colspan="2">Maintain existing Fish and Wildlife Habitat diversity. Actively promote the recovery of Federally-listed species such as Alabama beach mouse, piping plover/ least turn, nesting sea turtles, and other special status species.</td><td>No specific management goals and objectives are proposed.</td></tr>
<tr><td colspan="4">Allowable Uses and Management Actions</td></tr>
<tr><td rowspan="3">No specific actions are proposed.</td><td colspan="2">Construct protective two dune walk-over structures (approx. 300 feet each) and install sand fence to enhance and protect existing dune habitat.</td><td rowspan="3">No specific actions are proposed.</td></tr>
<tr><td colspan="2">Reintroduce Alabama beach mice in suitable unoccupied habitat.</td></tr>
<tr><td colspan="2">Monitor sea turtle nesting and mark active nests for protection to maximize nestling survivorship.</td></tr>
<tr><td colspan="4">Minerals</td></tr>
<tr><td colspan="4">Management Goals and Objectives</td></tr>
<tr><td colspan="4">Provide for leasing, exploration, and development of BLM-administered non-USFS FMO, while protecting other resource values.</td></tr>
<tr><td colspan="4">Allowable Uses and Management Actions</td></tr>
<tr><td>The tracts would be open to leasing, subject to standard lease terms and conditions.</td><td>The tracts would be closed to leasing to protect designated critical habitat for Alabama beach mouse.</td><td colspan="2">The tracts would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation (as described in Appendix D) to protect habitat for Alabama beach mouse, piping plover/least tern, and sea turtle nesting habitat.</td></tr>
<tr><td colspan="4">Recreation and Travel Management</td></tr>
<tr><td colspan="4">Management Goals and Objectives</td></tr>
<tr><td colspan="4">Allow recreation use, beach access, and travel compatible with other resource management objectives.</td></tr>
</tbody>
</table>

<table>
<tr><th>Alternative 1
(No Action)</th><th>Alternative 2</th><th>Alternative 3
(Preferred)</th><th>Alternative 4</th></tr>
<tr><td colspan="4">Allowable Uses and Management Actions</td></tr>
<tr><td>The tracts would remain open to recreation use.</td><td colspan="3">The tracts would be open to recreation compatible with habitat management including use of the beach and saltwater fishing.</td></tr>
<tr><td>The tracts would remain open to motorized vehicle use.</td><td colspan="3">The tracts would be designated as closed.</td></tr>
<tr><td colspan="4">Lands and Realty</td></tr>
<tr><td colspan="4">Management Goals and Objectives</td></tr>
<tr><td colspan="4">Manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values.</td></tr>
<tr><td colspan="4">Make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.</td></tr>
<tr><td colspan="4">Allowable Uses and Management Actions</td></tr>
<tr><td>Lots 24 (Section 25), 13 and 14 (Section 26), and 54 and 55 (Section 27) (Table 2-1 and Map 2-2) would be retained by BLM.</td><td>Lots 24 (Section 25), 13 and 14 (Section 26), and 54 and 55 (Section 27) (Table 2-1 and Map 2-2) would be retained by BLM. BLM would pursue opportunities to manage the tracts in partnership with USFWS and other agencies and organizations.</td><td>Lots 24 (Section 25), 13 and 14 (Section 26), and 54 and 55 (Section 27) (Table 2-1 and Map 2-2) would be available for transfer to the Bon Secour National Wildlife Refuge (NWR).
Secondarily, the lots would be available for disposal under the condition that uses would be consistent with the resource management goals and objectives and allowable uses and management actions established under this alternative.
In the case of R&PP conveyance, use would be controlled through approval of and compliance with the plan of development. In the case of FLPMA disposal (e.g., sale), restrictive covenants would be required to protect sensitive resources.</td><td>The tracts would be available for disposal from Federal ownership with no restrictive covenants. Disposal may not be allowed if they would jeopardize Federally-listed species or designated critical habitat. Land exchanges to benefit Federally-listed species would be permitted.</td></tr>
<tr><td>Lots 24 (Section 25), 13 and 14 (Section 26), and 54 and 55 (Section 27) would remain open to ROW applications.</td><td colspan="3">Lots 24 (Section 25), 13 and 14 (Section 26), and 54 and 55 (Section 27) would be avoidance areas for ROWs because of the presence of listed species and designated critical habitat.</td></tr>
<tr><td colspan="4">Lots 73 and 74 would be transferred to the USFWS as part of the Bon Secour NWR because they occur within the boundaries of the refuge.</td></tr>
</table>

Map 2-2

Alabama and Mississippi RMP-EIS



Ft. Morgan
Beach Tracts (28.70 total acres)

Baldwin County, AL

T. 9 S, R. 1 E, Sec. 25, Lot 24
T. 9 S, R. 1 E, Sec. 26, Lot 13
T. 9 S, R. 1 E, Sec. 26, Lot 14
T. 9 S, R. 2 E, Sec. 25, Lot 73
T. 9 S, R. 2 E, Sec. 25, Lot 74
T. 9 S, R. 2 E, Sec. 27, Lot 54
T. 9 S, R. 2 E, Sec. 27, Lot 55

St. Stephens Meridian

▨ Public Domain Lands

Projection: UTM, Zone 16 North
Datum: North American Datum of 1927 (NAD27)

Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Reasearch Institute
TOPO!, 2003 National Geographic Maps

Scale 1:480,000

Scale 1:12,000,000

Land Tracts
Baldwin County
N
Little Point Clear
BON SECOUR BAY
BON SECOUR BAY
Palmetto Beach
Cedar Grove
Gulf Highlands
T. 9 S, R. 1 E, Sec. 26, Lot 14
T. 9 S, R. 1 E, Sec. 25, Lot 24
T. 9 S, R. 1 E, Sec. 26, Lot 13
T. 9 S, R. 2 E, Sec. 27, Lot 54
T. 9 S, R. 2 E, Sec. 27, Lot 55
T. 9 S, R. 2 E, Sec. 25, Lot 74
T. 9 S, R. 2 E, Sec. 25, Lot 73

Scale 1:60,000

0 0.25 0.5 1 1.5 2
Miles

0 1,250 2,500 5,000 7,500 10,000
Feet

1 inch equals 5,000 feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

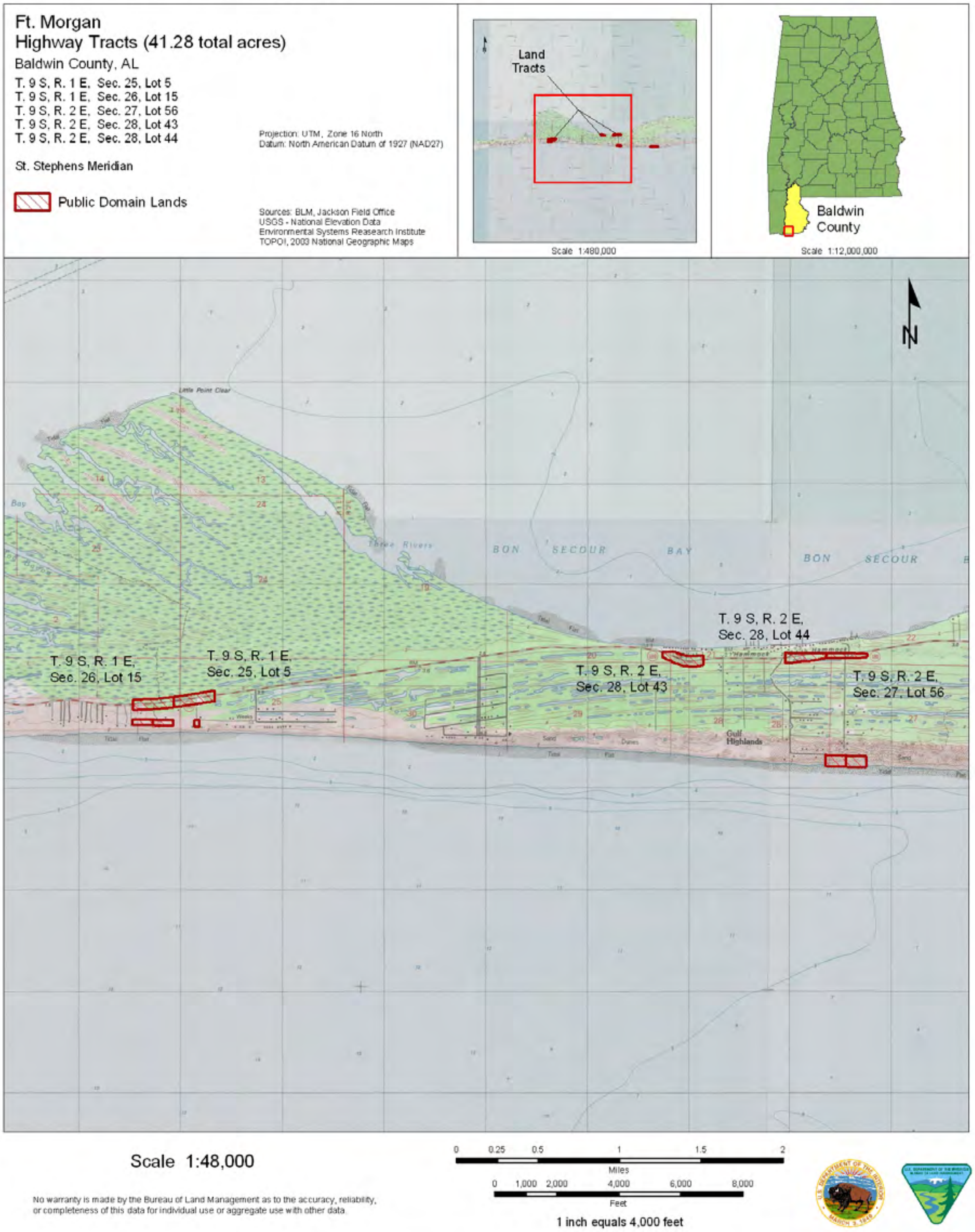
Table 2-8. Alternatives for Fort Morgan Highway Tracts (Map 2-3)

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
Vegetative Communities			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally-listed and other special status plant species and imperiled plant communities.			
Control noxious and invasive plant species.			
Allowable Uses and Management Actions			
No specific actions proposed.	Remove invasive species such as cogon grass and Chinese tallow using an integrated program of hand removal and selective, hand application of herbicide.		No specific actions are proposed.
	Establish baseline inventories of special status plant species.		
Fish and Wildlife Habitat			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally-listed and other special status fish and wildlife species and their habitat.			
No specific management goals and objectives are proposed.	Maintain existing fish and wildlife habitat diversity. Actively promote the recovery of the Federally-listed Alabama beach mouse and other endemic species, particularly migratory songbirds and raptors, using the flatwood, scrub, and wetland habitats occurring on these tracts.		No specific management goals and objectives are proposed.
Allowable Uses and Management Actions			
No specific actions are proposed.	Incorporate Lots 5 and 15 (29 acres) into future prescribed burns conducted on adjacent Bon Secour NWR land to improve habitat values for migratory birds and scrub endemics as needed, depending on resource conditions, and in cooperation with the FWS.		No specific actions are proposed.
Minerals			
Management Goals and Objectives			
Provide for leasing, exploration, and development of BLM-administered non-USFS FMO, while protecting other resource values.			
Allowable Uses and Management Actions			
The tracts would be open to leasing and subject to standard lease terms and conditions.	The tracts would be closed to leasing to protect designated critical habitat for Alabama beach mouse.	The tracts would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation (as described in Appendix D) to protect habitat for Alabama beach mouse and a 250-ft. buffer from wetlands and aquatic habitat.	
Recreation and Travel Management			
Management Goals and Objectives			
Allow recreation use compatible with other resource management objectives.			
Allowable Uses and Management Actions			
The tracts would remain open to recreation use.	The tracts would be open to recreation compatible with habitat management including sightseeing and hiking.		

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
The tracts would remain open to motorized vehicle use.	The tracts would be designated as closed.		
Lands and Realty			
Management Goals and Objectives			
Manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values.			
Make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.			
Allowable Uses and Management Actions			
The tracts would be retained by BLM.	The tracts would be retained by BLM. BLM would pursue opportunities to manage the tracts in partnership with USFWS and other agencies and organizations.	The tracts would be available for transfer to the Bon Secour NWR. Secondarily, the tracts would be available for disposal under the condition that uses would be consistent with the resource management goals and objectives and allowable uses and management actions established under this alternative. In the case of R&PP conveyance, use after disposal would be controlled through approval of and compliance with the plan of development. In the case of FLPMA disposal (e.g., sale), restrictive covenants would be required to protect sensitive resources.	The tracts would be available for disposal from Federal ownership with no restrictive covenants. Disposal may not be allowed if they would jeopardize Federally-listed species or designated critical habitat. Land exchanges to benefit Federally-listed species would be permitted.
The tracts would remain open to ROW applications.	Existing facilities within the highway ROW corridor would be allowed. New disturbance would be avoided because of the presence of Federally-listed species and designated critical habitat.		

Map 2-3

Alabama and Mississippi RMP-EIS


Ft. Morgan
Highway Tracts (41.28 total acres)
Baldwin County, AL
T. 9 S, R. 1 E, Sec. 25, Lot 5
T. 9 S, R. 1 E, Sec. 26, Lot 15
T. 9 S, R. 2 E, Sec. 27, Lot 56
T. 9 S, R. 2 E, Sec. 28, Lot 43
T. 9 S, R. 2 E, Sec. 28, Lot 44
St. Stephens Meridian
▨ Public Domain Lands
Projection: UTM, Zone 16 North
Datum: North American Datum of 1927 (NAD27)
Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Reasearch Institute
TOPO!, 2003 National Geographic Maps
Land Tracts
Scale 1:480,000
Baldwin County
Scale 1:12,000,000
N
BON SECOUR BAY
BON SECOUR
Little Point Clear
T. 9 S, R. 1 E, Sec. 26, Lot 15
T. 9 S, R. 1 E, Sec. 25, Lot 5
T. 9 S, R. 2 E, Sec. 28, Lot 43
T. 9 S, R. 2 E, Sec. 28, Lot 44
T. 9 S, R. 2 E, Sec. 27, Lot 56
Gulf Highlands
Scale 1:48,000
0 0.25 0.5 1 1.5 2
Miles
0 1,000 2,000 4,000 6,000 8,000
Feet
1 inch equals 4,000 feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

Table 2-9. Alternatives for Fowl River Tract (Map 2-4)

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
Vegetative Communities			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally-listed and other special status plant species and imperiled plant communities.			
Control noxious and invasive plant species.			
No specific goals and objectives are proposed.	Promote establishment and retention of native wetland and flatwood plant communities.		No specific goals and objectives are proposed.
Allowable Uses and Management Actions			
No specific actions proposed.	Remove invasive species such as mimosa (*Albizia julibrissin Durazz L*.) by hand and with selective, hand application of herbicide.		No specific actions are proposed.
	Establish baseline inventories to monitor plant communities.		
Fish and Wildlife Habitat			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally-listed and other special status fish and wildlife species and their habitat.			
Allowable Uses and Management Actions			
No specific actions are proposed.	Monitor fledgling success of active bald eagle nests.		No specific actions are proposed.
Minerals			
Management Goals and Objectives			
Provide for leasing, exploration, and development of BLM-administered non-USFS FMO, while protecting other resource values.			
Allowable Uses and Management Actions			
The tract would be open to leasing and subject to standard lease terms and conditions.	The tract would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation of a 1,000-ft. buffer from wetlands and aquatic habitat, and stipulations to protect bald eagle nesting and roosting habitat, as described in Appendix D.	The tract would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation of a 250-ft. buffer from wetlands and aquatic habitat, and stipulations to protect bald eagle nesting and roosting habitat, as described in Appendix D.	
Recreation and Travel Management			
Management Goals and Objectives			
Allow recreation use compatible with other resource management objectives.			
Allowable Uses and Management Actions			
The tract would remain open to recreation use.	The tract would be open to recreation use including access for fishing, canoeing and kayaking.		

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
The tract would remain open to motorized vehicle use.	The tract would be designated as closed.		
Lands and Realty			
Management Goals and Objectives			
Manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values.			
Make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.			
Allowable Uses and Management Actions			
The tract would be retained by BLM.	The tract would be retained by BLM. BLM would pursue opportunities to manage the tracts in partnership with other agencies and organizations.	The tract would be available for disposal under the condition that uses would be consistent with the resource management goals and objectives and allowable uses and management actions established under this alternative. In the case of R&PP conveyance, use after disposal would be controlled through approval of and compliance with the plan of development. In the case of FLPMA disposal (e.g., sale), restrictive covenants would be required to protect sensitive resources.	The tract would be available for disposal from Federal ownership with no restrictive covenants. Disposal may not be allowed if they would jeopardize Federally-listed species, associated with adjacent wetland/aquatic habitat. Land exchanges to benefit Federally-listed species would be permitted.
The tract would remain open to ROW applications.	The tract would be an avoidance area for ROWs to protect native vegetative communities and adjacent wetland/aquatic habitat.		

Map 2-4

Alabama and Mississippi RMP-EIS

Fowl River Tract (41.73 total acres)
Mobile County, AL

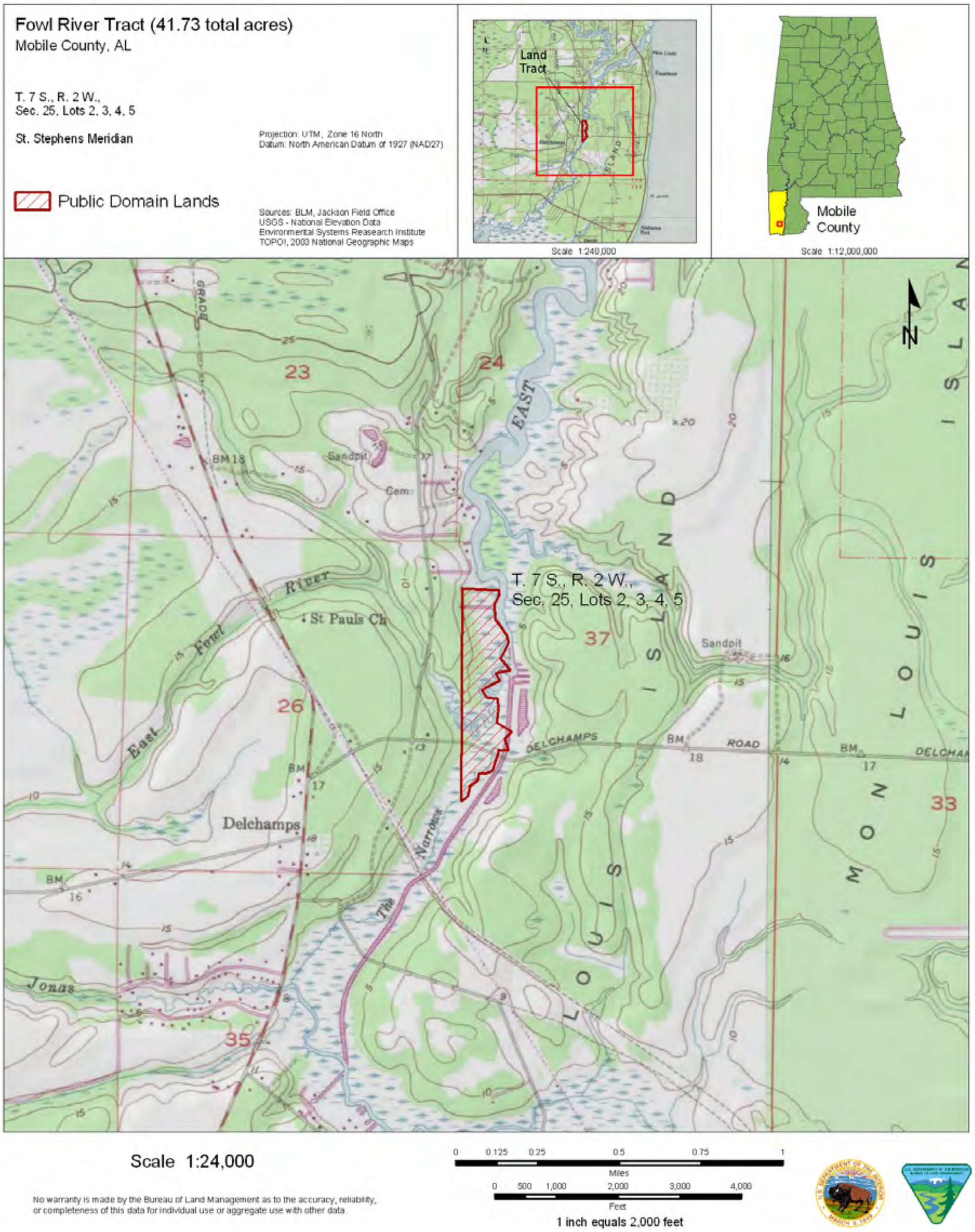
T. 7 S., R. 2 W.,
Sec. 25, Lots 2, 3, 4, 5

St. Stephens Meridian

▨ Public Domain Lands

Projection: UTM, Zone 16 North
Datum: North American Datum of 1927 (NAD27)

Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Reasearch Institute
TOPO!, 2003 National Geographic Maps



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

Table 2-10. Alternatives for Geneva Tract (Map 2-5)

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
Vegetative Communities			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally-listed and other special status plant species and imperiled plant communities.			
Control noxious and invasive plant species.			
Allowable Uses and Management Actions			
No specific actions proposed.	Monitor and remove invasive species, as needed.	No specific actions are proposed.	
Fish and Wildlife Habitat			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally-listed and other special status fish and wildlife species and their habitat.			
Allowable Uses and Management Actions			
No specific actions are proposed.	Monitor changes in the tract that could affect Fish and Wildlife Habitat utilization.	No specific actions are proposed.	
Minerals			
Management Goals and Objectives			
Provide for leasing, exploration, and development of BLM-administered non-USFS FMO, while protecting other resource values.			
Allowable Uses and Management Actions			
The tract would be open to leasing and subject to standard lease terms and conditions.	The tract would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation (as described in Appendix D) of a 1,000-ft. buffer from aquatic habitat.	The tract would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation (as described in Appendix D) of a 250-ft. buffer from aquatic habitat.	
Recreation and Travel Management			
Management Goals and Objectives			
Allow recreation use compatible with other resource management objectives.			
Allowable Uses and Management Actions			
The tract would remain open to recreation use.	The tract would be open to recreation use including canoeing, kayaking and fishing.		
The tract would remain open to motorized vehicle use.	The tract would be designated as closed.		
Lands and Realty			
Management Goals and Objectives			
Manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values.			

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
Make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.			
Allowable Uses and Management Actions			
The tract would be retained by BLM.	The tract would be retained by BLM. BLM would pursue opportunities to manage the tracts in partnership with other agencies and organizations.	The tract would be available for disposal from Federal ownership.	
The tract would remain open to ROW applications.	The tract would be a ROW avoidance area because it is in a floodplain and critical habitat for Gulf sturgeon.		

Map 2-5

Alabama and Mississippi RMP-EIS

Geneva Tract (0.95 total acres)
East Fork Choctawhatchee River
Geneva County, AL

T. 7 S, R. 2 W,
Sec. 25, Lot 2

Tallahassee Meridian

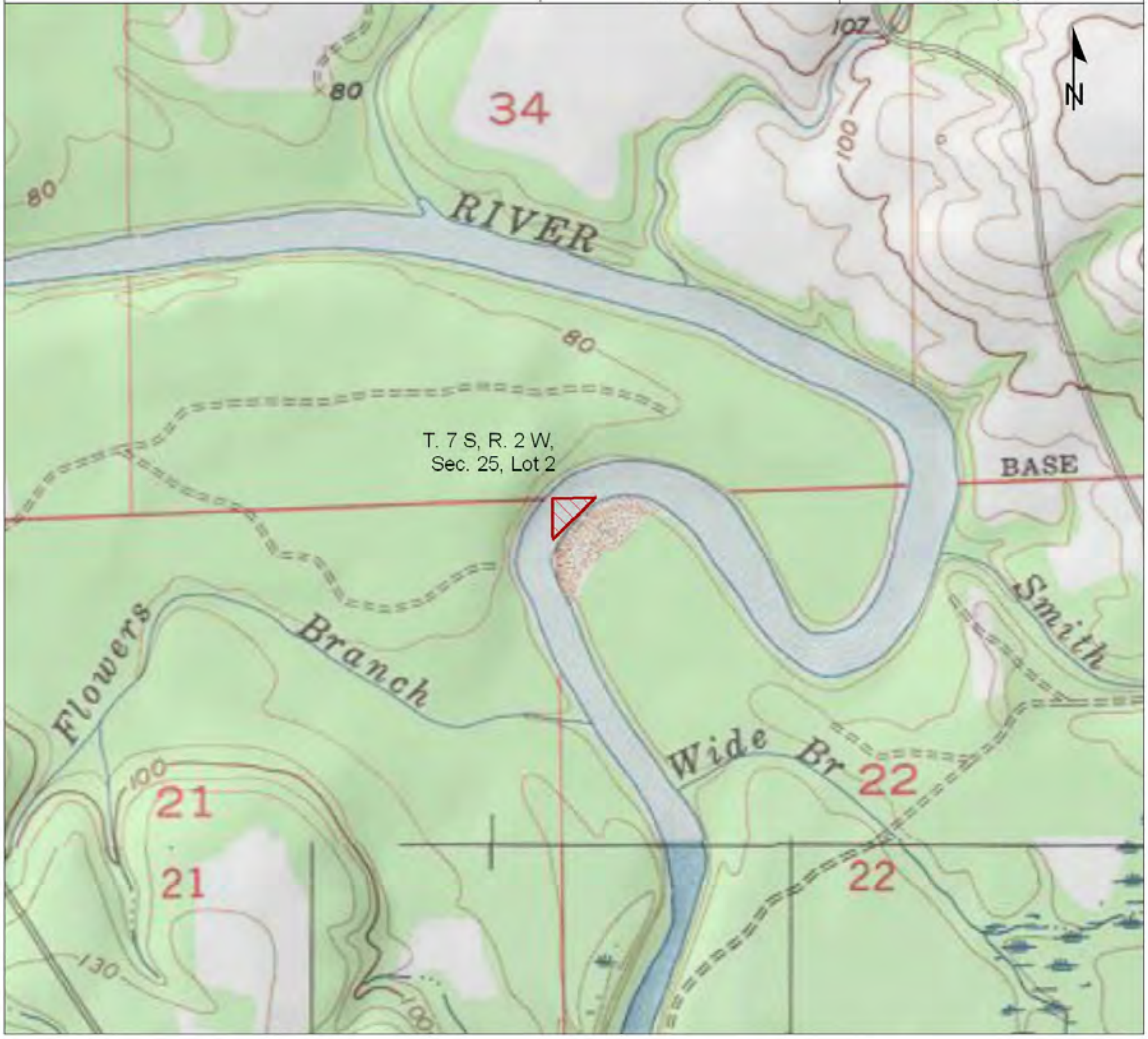
Projection: UTM, Zone 16 North
Datum: North American Datum of 1927 (NAD27)

▨ Public Domain Lands

Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Reasearch Institute
TOPO!, 2003 National Geographic Maps

Scale 1:240,000

Scale 1:12,000,000



Scale 1:12,000

0 0.045 0.09 0.18 0.27 0.36 0.45
Miles
0 220 440 880 1,320 1,760
Feet
1 inch equals 1,000 feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

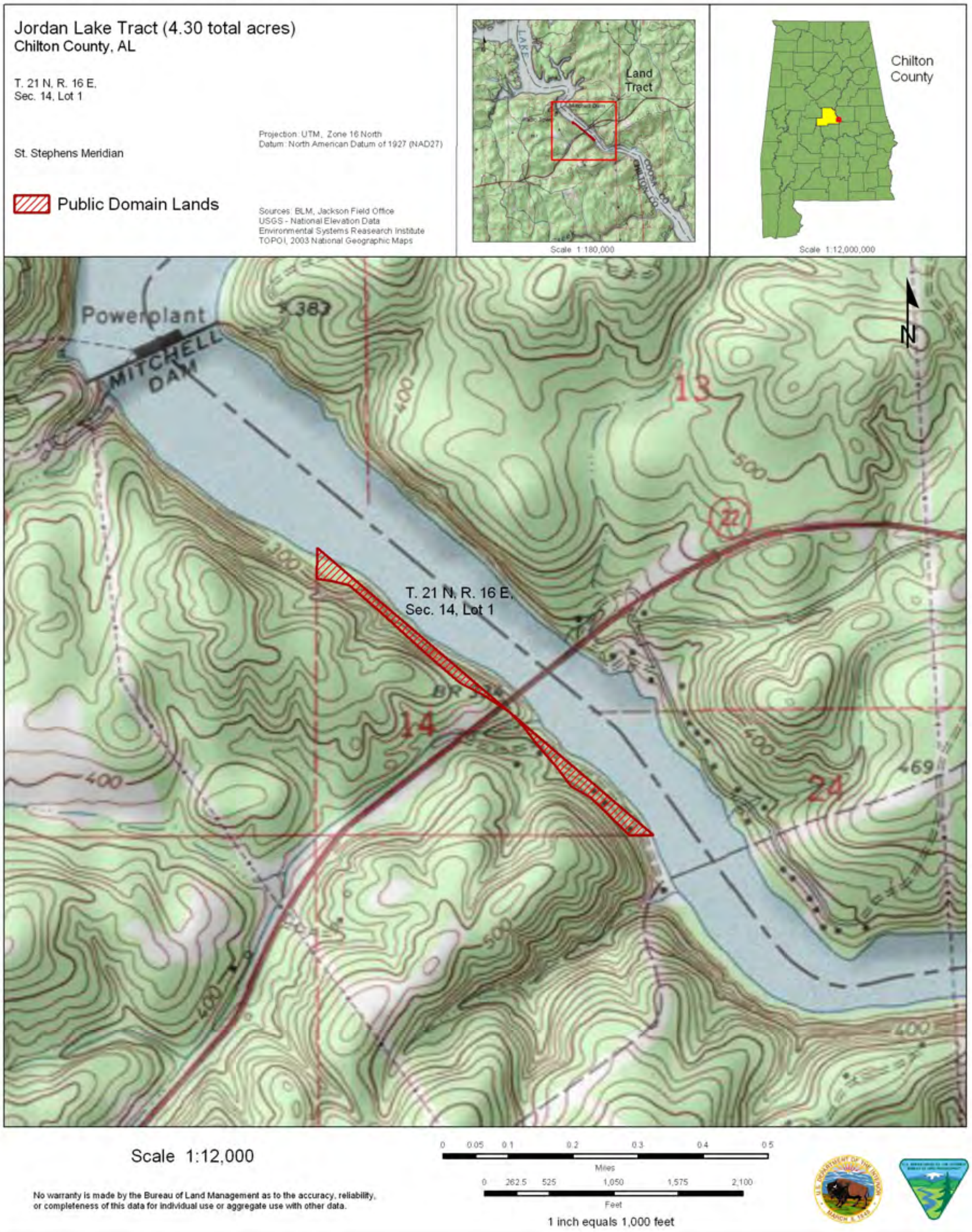
Table 2-11. Alternatives for Jordan Lake Tract (Map 2-6)

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
Vegetative Communities			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally-listed and other special status plant species and imperiled plant communities.			
Control noxious and invasive plant species.			
Allowable Uses and Management Actions			
No specific actions proposed.	Monitor and remove invasive species, such as mimosa, Chinese tallow, and cogon grass, as needed, by hand and with selective, hand application of herbicide.	No specific actions are proposed.	
Fish and Wildlife Habitat			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally-listed and other special status fish and wildlife species and their habitat.			
Allowable Uses and Management Actions			
No specific actions are proposed.	Conduct inventory of fish and wildlife and special status species to establish baseline diversity.	No specific actions are proposed.	
Minerals			
Management Goals and Objectives			
Provide for leasing, exploration, and development of BLM-administered non-USFS FMO, while protecting other resource values.			
Allowable Uses and Management Actions			
The tract would be open to leasing and subject to standard lease terms and conditions.	The tract would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation (as described in Appendix D) of a 1,000-ft. buffer from aquatic habitat.	The tract would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation (as described in Appendix D) of a 250-ft. buffer from aquatic habitat.	
Recreation and Travel Management			
Management Goals and Objectives			
Allow recreation use compatible with other resource management objectives.			
Allowable Uses and Management Actions			
The tract would remain open to recreation use.	The tract would be open to recreation use including access to Jordan Lake for swimming and fishing.		
The tract would remain open to motorized vehicle use.	The tract would be designated as limited. Motorized vehicle use would be limited to State or county maintained roads or other transportation routes specifically designated by a BLM-issued ROW. Other motorized vehicle access would be limited to administrative use and emergency response.		

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
Lands and Realty			
Management Goals and Objectives			
Manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values.			
Make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.			
Allowable Uses and Management Actions			
The tract would be retained by BLM.	The tract would be retained by BLM. BLM would pursue opportunities to manage the tract in partnership with other agencies and organizations.	The tract would be available for disposal from Federal ownership.	
The tract would remain open to ROW applications.	The tract would be open for ROWs due to adjacent development and uses. ROWs would be collocated if possible.		

Map 2-6

Alabama and Mississippi RMP-EIS



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

Table 2-12. Alternatives for Hancock County, Mississippi, Tract[1] (Map 2-7)

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
Vegetative Communities			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally-listed and other special status plant species and imperiled plant communities.			
Control noxious and invasive plant species.			
Allowable Uses and Management Actions			
No specific actions are proposed.	Monitor for early detection of invasive plant species such as cogon grass and Chinese tallow. If detected, invasive species would be removed by hand or through selective, hand application of herbicide.		No specific actions are proposed.
Fish and Wildlife Habitat			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally-listed and other special status fish and wildlife species and their habitat.			
No specific goals and objectives are proposed.	Protect and enhance the estuarine coastal wetland marshes in support of the Mississippi Coastal Preserve System.		No specific goals and objectives are proposed.
Allowable Uses and Management Actions			
No specific actions are proposed.	Prescribed burns would be used, as needed, depending on resource conditions, and in cooperation with the State of Mississippi to promote marsh health.		No specific actions are proposed.
Minerals			
Management Goals and Objectives			
Provide for leasing, exploration, and development of BLM-administered non-USFS FMO, while protecting other resource values.			
Allowable Uses and Management Actions			
The tract would be open to leasing and subject to standard lease terms and conditions.	The tract would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation (as described in Appendix D) for protection of Hancock County Marshes.		
Recreation and Travel Management			
Management Goals and Objectives			
Allow recreation use compatible with other resource management objectives.			
Allowable Uses and Management Actions			
The tract would remain open to motorized vehicle use.	The tract would be open to recreation use including fishing and waterfowl hunting.		
The tract would remain open to recreation use, including motorized vehicle use.	The tract would be designated as limited to motorized boats in areas of open water. Other motorized vehicle use would be limited to administrative use and emergency response.		

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
Lands and Realty			
Management Goals and Objectives			
Manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values.			
Make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.			
Allowable Uses and Management Actions			
The tract would be retained by BLM.	The tract would be retained by BLM. BLM would pursue opportunities to manage the tract in partnership with other agencies and organizations.		The tract would be available for disposal from Federal ownership with no restrictive covenants. Disposal may not be allowed if they would jeopardize Federally-listed species, associated with wetland/aquatic habitat. Land exchanges to benefit Federally-listed species would be permitted.
The tract would remain open to ROW applications.	The tract would be an avoidance area for ROWs to protect wetland habitat.		

1 These allowable uses and management actions would not occur unless the R&PP patent were to revert to BLM.

Map 2-7

Alabama and Mississppi RMP-EIS

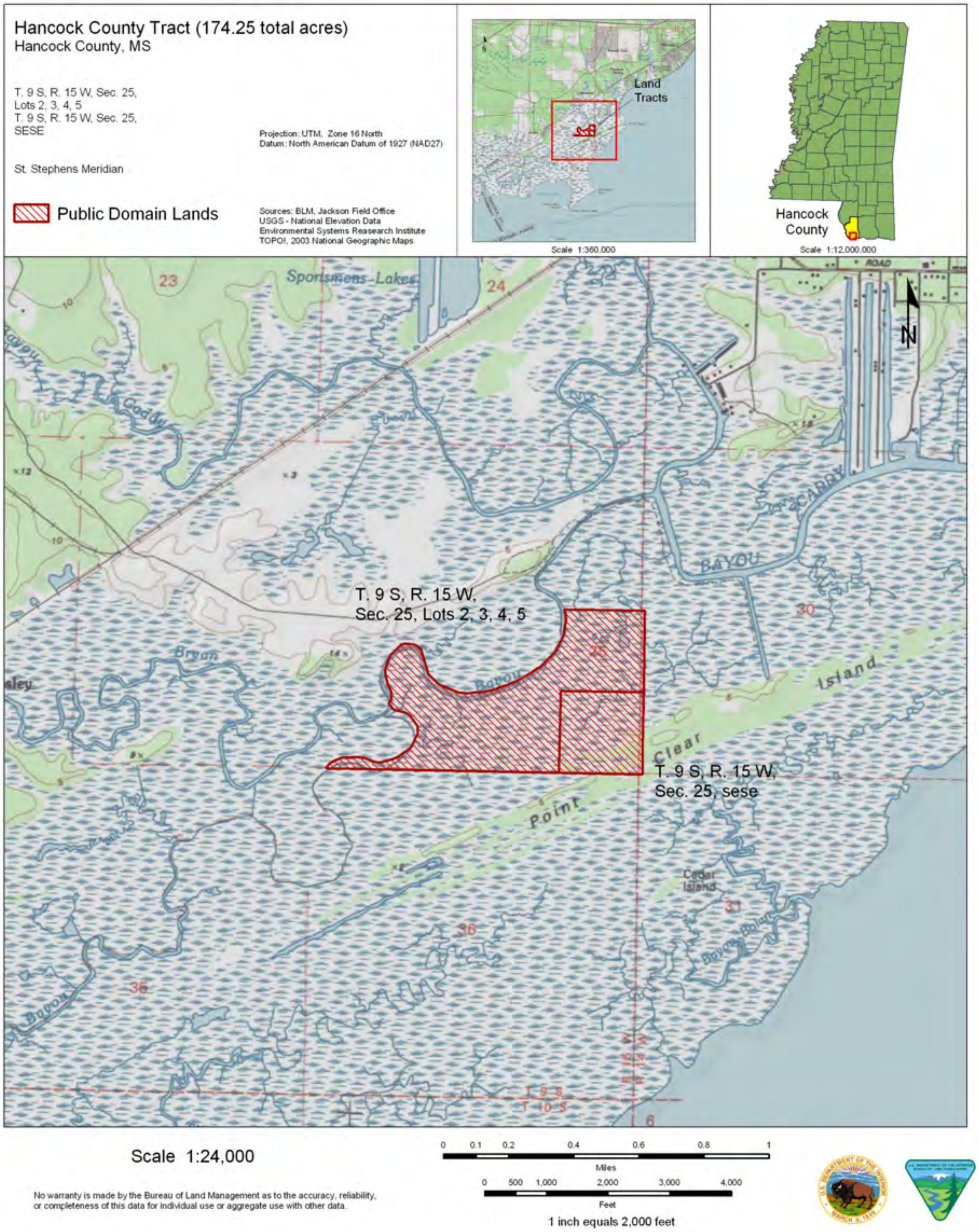

Hancock County Tract (174.25 total acres)
Hancock County, MS
T. 9 S, R. 15 W, Sec. 25,
Lots 2, 3, 4, 5
T. 9 S, R. 15 W, Sec. 25,
SESE
St. Stephens Meridian
▨ Public Domain Lands
Projection: UTM, Zone 16 North
Datum: North American Datum of 1927 (NAD27)
Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Reasearch Institute
TOPO!, 2003 National Geographic Maps
Land Tracts
Scale 1:360,000
Hancock County
Scale 1:12,000,000
Sportsmens Lakes
23
24
30
31
36
6
ROAD
BAYOU
Bryan
Clear
Point
Island
Cedar Island
N
T. 9 S, R. 15 W, Sec. 25, Lots 2, 3, 4, 5
T. 9 S, R. 15 W, Sec. 25, sese
T 9 S
T 10 S
Scale 1:24,000
0 0.1 0.2 0.4 0.6 0.8 1
Miles
0 500 1,000 2,000 3,000 4,000
Feet
1 inch equals 2,000 feet
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

Table 2-13. Comparison of Impacts For Alabama

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
Air Quality			
Wildfire could lead to air emissions. Suppression of all fires would result in short term localized impacts, but not anticipated to deteriorate air quality conditions.			
Management actions on the surface tracts (159 acres), including potential ROW development and recreation and travel use, would not be anticipated to deteriorate air quality conditions.	Although more management actions are proposed for the surface tracts (159 acres), including vegetation and fish and wildlife habitat treatments, these actions would not be anticipated to deteriorate air quality conditions. Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) would be managed as avoidance areas, there would be less potential for emissions associated with ROW development compared to Alternative 1.		Impacts would be the same as Alternative 1, except managing the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) as avoidance areas would result in a decreased potential for emissions associated with ROW development compared to Alternative 1.
Estimated emissions from development of 20 oil and gas wells on non-USFS FMO would be responsible for less than one percent of emissions from the mineral development across Alabama for Nitrogen Oxides (NO_x), Sulfer Dioxide (SO_2), Particulate Matter (PM_{10}), Carbon Monoxide (CO), and Volatile Organic Compounds (VOCs). Those emissions would likely occur over a dispersed area and would not cause any noticeable or measurable effect. Potential oil and gas development on some non-USFS FMO tracts would be in close proximity to the Sipsey Wilderness and the Birmingham nonattainment area. Oil and gas emissions in those tracts could impact wilderness air quality values and jeopardize attainment of ambient air quality. Based on expected emissions. air quality impacts would not be anticipated.			
Estimated emissions from 1.9 million tons of Federal coal produced annually over the next 20 years would be responsible for less than one percent of emissions from other mineral development in the Black Warrior Coal Basin for NO_x, SO_2, PM_{10}, CO, and VOCs.			
Soil Resources			
Management actions on the surface tracts (159 acres), including potential ROW development and recreation and travel use, could impact soils through vegetation clearing activities and ground disturbance. Wind and water erosion, and subsequent loss in soil productivity would occur in disturbed areas where revegetation does not occur. These effects would be localized and short term in areas where revegetation is enhanced or permitted. The effect would be long term but localized if roads or structures were constructed on the	Management actions proposed for the surface tracts (159 acres), such as removing invasive species and conducting prescribed fire, could increase site-specific erosion in the short term. Sand deposition would be facilitated by planting native coastal dune vegetation as part of dune restoration activities after damage by major storms. Over the long term, improving vegetation communities and fish and wildlife habitat would reduce erosion and overland flows. Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva	Impacts from management actions proposed for the surface tracts (159 acres) would be the same as Alternative 2, except disposing the surface tracts from Federal ownership could increase the chances for subsequent development and associated impacts on soils. However, following disposal, development and use of the tract would be consistent with RMP objectives, which would prevent disposal-related impacts from occurring.	Impacts would be the same as Alternative 1, except managing the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) as avoidance areas would result in a decreased potential for soil impacts associated with ROW development compared to Alternative 1. Disposal the surface tracts from Federal ownership without conditions could increase chances for subsequent development and

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
tracts.	tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) would be managed as avoidance areas, there would be less potential for ground disturbance and increased erosion associated with ROW development compared to Alternative 1.		associated impacts on the tracts. Subsequent development of the tracts could result in impacts to soils from vegetation-clearing activities and construction ground disturbance, which could increase surface runoff and erosion.
Oil and gas development could result in both a slight decline in soil productivity and an increase in surface runoff. Cut and fill areas to support well pads and access routes can contribute to local soil erosion. Except for 8,179 acres closed to leasing by other surface managing agencies, non-USFS FMO would be open to leasing subject to standard lease terms and conditions (305,640 acres). The estimated development of 20 wells in Alabama over the next 20 years would disturb approximately 105 non-USFS FMO acres. Required reclamation by Federal and State laws and the minimal surface that might be disturbed would produce only localized effects on soils. Operation of the oil and gas wells could also impact the surrounding soils by potential contamination from accidental spills or improper management of hazardous materials or waste; however, Federal, State, and local regulations would require site characterization and corrective action to restore soil integrity and productivity.	Anticipated levels of oil and gas development and associated impacts on 105 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (91,702 acres), and NSO (94,589 acres) restrictions would be implemented, which reduces disturbance to soils within the protected areas.	Anticipated levels of oil and gas development and associated impacts on 105 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (117,506 acres), and NSO (43,239 acres) restrictions would be implemented, which would reduce disturbance to soils within the protected areas. Under this alternative, the 1,000-foot NSO area around aquatic habitats identified in Alternative 2 would be reduced to 250-feet, which would reduce protections to soils within these areas. In most cases, this buffer is expected to prevent construction activities from increasing erosion to the point that sedimentation of local drainages and wetlands increases. In areas with slopes over 25 percent, additional measures may be needed to stabilize disturbed soils.	
Future coal development is not anticipated to disturb the surface; therefore, impacts to soils are not anticipated.			

<table>
<tr><th>Alternative 1
(No Action)</th><th>Alternative 2</th><th>Alternative 3
(Preferred)</th><th>Alternative 4</th></tr>
<tr><td colspan="4">Water Resources</td></tr>
<tr><td>Management actions on the surface tracts (159 acres), including potential ROW development and recreation and travel use, could result in short term and site-specific increases in erosion and surface run-off, which increases nutrient levels and turbidity and decreases water quality. Impacts would be short term in areas where revegetation was enhanced or permitted. The effect would be long term but localized if roads or structures were constructed on the tracts.</td><td colspan="2">Management actions proposed for the surface tracts (159 acres), such as removing invasive species and conducting prescribed fire, could increase site-specific erosion, which increases nutrient levels and turbidity and decreases water quality in the short term. Over the long term, improving vegetation communities would reduce erosion and overland flows.
Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) would be managed as avoidance areas, there would be less potential for ground disturbance and increased erosion associated with ROW development compared to Alternative 1. No coastal wetland habitats or water bodies occur on or adjacent to the Fort Morgan Highway tracts. Development of additional transportation routes and ROW on the Jordan Lake tract could contribute to the already degrading water quality of the Coosa River.</td><td>Impacts would be the same as Alternative 1, except managing the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) as avoidance areas would result in a decreased potential for impacts to water resources associated with ROW development compared to Alternative 1.</td></tr>
<tr><td>Except for 8,179 acres closed to leasing by other surface managing agencies, non-USFS FMO would be open to leasing subject to standard lease terms and conditions (305,640 acres). The estimated development of 20 wells in Alabama over the next 20 years would disturb approximately 105 non-USFS FMO acres. Required reclamation by Federal and State laws and the minimal surface that might be disturbed would produce only localized effects on water resources.
Oil and gas development could result in surface run-off, which increases nutrient levels and turbidity and decreases water quality. Leakage of drill fluids, hazardous waste spills, or leakage from reserve pits could be introduced into the ground water as well. Additionally, access roads and well pads can alter the local hydrology reducing surface flow to mesic areas and diverting or</td><td>Anticipated levels of oil and gas development and associated impacts on 105 acres would be the same as Alternative 1. A 1,000-foot NSO buffer around aquatic habitats and applying the stipulations in Appendix D would increase the area where seasonal, CSU (91,702 acres), and NSO (94,589 acres) restrictions would be implemented, which would reduce disturbance to water resources within the protected areas. This stipulation could be applied to an estimated 90,930 acres or 29 percent of the non-USFS FMO available for leasing in Alabama. In most cases, this buffer is expected to prevent construction activities from increasing the sedimentation of local drainages and wetlands.</td><td colspan="2">Anticipated levels of oil and gas development and associated impacts on 105 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (117,506 acres), and NSO (43,239 acres) restrictions would be implemented, which would reduce disturbance to water resources within the protected areas. Under this alternative, the 1,000-foot NSO area around aquatic habitats identified in Alternative 2 would be reduced to 250-feet, which would allow development to occur in close proximity to water resources and the potential for impacts to occur. In most cases, this buffer is expected to prevent construction activities from increasing the sedimentation of local drainages and wetlands. In areas with slopes over 25 percent, additional measures may be needed to stabilize disturbed soils above wetlands or aquatic habitats to the point they aren’t impacted by increased sedimentation.</td></tr>
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Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
degrading surface water. Because surface discharge of produced water would be a permitted activity requiring standards of water quality, direct impacts to water quality from the disposal of water produced from oil and gas production on non-USFS FMO would be minimized.			
Coal development in the Warrior Basin would involve mining of existing underground coal mines, which would further increase the potential for groundwater contamination. Migration of contaminants into the surrounding soils and aquifers could degrade groundwater quality and thereby affect wells and springs that may serve household and domestic uses.			
Vegetative Communities			
Management actions on the surface tracts (159 acres) could result in surface-disturbing activities that would impact vegetative communities. These actions would result in vegetation-clearing and disturbance associated with construction, which could alter vegetation communities. Wind and water erosion in disturbed areas could impede the regrowth of vegetation, allow noxious weeds to grow, and potentially deteriorate aquatic habitats. Retaining surface tracts in Federal ownership would continue the application of protective measures provided by Federal law and agency policies that would provide adequate protection of vegetation.	Impacts from surface-disturbing activities would be reduced under this alternative compared to Alternative 1 due to limitation on motorized recreation, managing for native vegetation and habitat, and managing the Coosa River, Fort Morgan Beach, Fort Morgan Highway, Fowl River, and Geneva tracts as avoidance areas for ROW. Impacts from retaining surface tracts in Federal ownership and pursuing partnerships to provide management would more directly benefit vegetation by restoring and maintaining continuity and composition of habitat than anticipated under Alternative 1.	Impacts from surface-disturbing activities would be the same as Alternative 2. Impacts from disposing surface tracts out of Federal ownership consistent with resource management objectives would be the same as Alternative 1.	Impacts from surface-disturbing activities would be the same as Alternative 1. Disposing surface tracts out of Federal ownership without conditions for management and use after disposal could increase the potential for subsequent development and associated impacts to vegetation. Such development could eliminate and fragment vegetation communities, leaving small, isolated populations that are more vulnerable to habitat modification and degradation.

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
The estimated 20 wells to be developed in Alabama over the life of this plan would disturb approximately 105 non-USFS FMO acres. Although 305,640 acres are open to leasing, the potential is low for impacts to sensitive vegetation communities because leasing stipulations would be developed as appropriate to protect for vegetation.	Impacts from fluid mineral leasing management actions on split estate would be the same as Alternative 1. However, Alternative 2 uses more stringent leasing stipulations in managing all non-USFS FMO. Additional protections would be applied to 91,702 acres managed as CSU, 94,589 acres as NSO, and 8,297 acres closed to leasing.	Impacts under Alternatives 3 and 4 would be similar to those of Alternative 2 except buffers for aquatic species and protections of Alabama beach mouse habitat would be reduced. Stipulations would be applied to 117,506 acres managed as CSU, 43,239 acres as NSO, and 8,179 acres closed to leasing.	
Future coal development is not anticipated to disturb the surface; therefore, impacts to vegetative communities are not anticipated.			
Fish and Wildlife			
Management actions on the surface tracts (159 acres) could result in surface-disturbing activities. These actions would result in vegetation-clearing activities and disturbance associated with construction, which could displace wildlife and alter vegetation, habitat, and forage components important to wildlife in localized areas. This could impair species viability and reduce habitat quality for a variety of species. Wind and water erosion in disturbed areas could impede the regrowth of vegetation, allow noxious weeds to grow, and potentially deteriorate aquatic habitats. Retaining surface tracts in Federal ownership would continue the application of protective measures provided by Federal law and agency policies that would provide adequate protection of wildlife habitat.	Impacts from surface-disturbing activities would be reduced under this alternative compared to Alternative 1 due to limitation on motorized recreation, managing for existing wildlife diversity and undertaking actions to manage for sensitive wildlife species, and managing the Coosa River, Fort Morgan Beach, Fort Morgan Highway, Fowl River, and Geneva tracts as avoidance areas for transportation project ROWs. Impacts from retaining surface tracts in Federal ownership and pursuing partnerships to provide management would more directly benefit wildlife by restoring and maintaining continuity and composition of habitat than anticipated under Alternative 1.	Impacts from surface-disturbing activities would be the same as Alternative 2. Impacts from disposing surface tracts out of Federal ownership consistent with resource management objectives would be the same as Alternative 1.	Impacts from surface-disturbing activities would be the same as Alternative 1. Disposing surface tracts out of Federal ownership without conditions for management and use after disposal could increase the potential for subsequent development and associated impacts to vegetation. Such development could eliminate and fragment wildlife habitat, leaving small, isolated populations that are more vulnerable to habitat modification and degradation.

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
The estimated 20 wells to be developed in Alabama over the life of this plan would disturb approximately 105 non-USFS FMO acres. Although 305,640 acres are open to leasing, the potential is low for impacts to sensitive wildlife because leasing stipulations would be developed as appropriate to protect wildlife.	Impacts from mineral leasing management actions on split estate would be the same as Alternative 1. However, Alternative 2 uses more stringent leasing stipulations in managing all non-USFS FMO with exception, waiver, and modification criteria applied as determined through agency direction. Additional protections would be applied to 91,702 acres managed as CSU, 94,589 acres as NSO, and 8,297 acres closed to leasing.	Impacts under Alternatives 3 and 4 would be similar to those of Alternative 2 except buffers for aquatic species and protections of Alabama beach mouse habitat would be reduced. Stipulations would be applied to 117,506 acres managed as CSU, 43,239 acres as NSO, and 8,179 acres closed to leasing.	
Special Status Species			
Lack of specific areas and species being managed could increase the potential for exotic, invasive species to become established or spread on BLM surface tracts. Cogon grass at the Fort Morgan Highway tracts, in particular, has the potential to alter Alabama beach mouse critical habitat as it forms dense stands displacing native herbaceous plants and potentially increasing fire frequency and intensity. The coastal dune habitat associated with the Fort Morgan beach tracts would continue to be trampled at traditional beach access points damaging habitat for Alabama beach mouse. Dispersed recreation use of the Coosa River tracts has the potential to cause bald eagles to abandon nest sites. Retaining the surface tracts in Federal ownership would continue the application of protective measures provided by Federal law and agency policies that would	Alabama beach mouse and nesting shore birds would benefit from plantings of native coastal dune vegetation on the Fort Morgan beach tracts after damaging storms. These plantings promote sand deposition and help to reestablish the dunes more quickly. On the Fowl River, Coosa River, and Fort Morgan Highway tracts, woody exotic, invasive species such as Chinese tallow and Chinese privet would be removed by hand and stump treated with approved herbicides. Alabama beach mouse and nesting shore birds at the Fort Morgan Beach tracts would benefit from the installation of two dune walk-overs which would eliminate damaging foot traffic, and allow dunes and vegetation to recover at traditional public access areas at Veterans Road and Mobile Road. Impacts from retaining surface tracts in Federal ownership and pursuing partnerships to provide management	Impacts from surface tract management, including vegetative communities and fish and wildlife habitat, would be the same as Alternative 2. Under this alternative, the Geneva and Jordon Lake tracts would be transferred out of Federal ownership without conditions. These tracts are adjacent to Gulf sturgeon critical habitat, but no changes of use are anticipated if it were transferred to private ownership that would affect critical habitat.	Impacts from surface tract management, including vegetative communities and fish and wildlife habitat, would be the same as Alternative 1. The transfer of the BLM surface tracts to private ownership are likely to result in loss of habitat for the Alabama beach mouse, piping plover, snowy plover, and bald eagle, as well as potential habitat for Alabama red-belly turtle. Any development of the beach tracts would result in the direct loss of occupied critical habitat for the Alabama beach mouse. Development of the Fort Morgan Highway tracts are likely to result in the loss of important scrub habitats designated as critical habitat. Because the Fort Morgan Beach and Highway tracts are designated critical habitat, USFWS would have to authorize a taking permit through the Section 7 process of the ESA to before such transfers could be approved.

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<tr><td>provide adequate protection of special status species.</td><td>would more directly benefit special status species by restoring and maintaining continuity and composition of habitat than anticipated under Alternative 1.</td><td></td><td></td></tr>
<tr><td>Oil and gas development on non-USFS FMO in Alabama is expected to result in the disturbance of 105 acres of habitat, any of which could occur in areas supporting special status species. Impacts to special status species could include the direct loss of habitat and/or degradation of aquatic or wetland habitats for the Alabama beach mouse, loggerhead sea turtle, piping plover, snowy plover, Wilson's plover, gopher tortoise, Red-cockaded woodpecker, bald eagle, and special status fish species. Section 7 consultations with the USFWS would be required prior to BLM permitting any action that could adversely affect these Federally-listed species or designated habitat, and subsequent actions would comply with the conditions established by any subsequent biological opinions (BOs).</td><td>Although the number of wells (20) and acres disturbed (105) would remain the same under this alternative, lease stipulations would shift surface-disturbing activities away from sensitive habitats with potential to support special status species. The coastline and all critical habitat for the Alabama beach mouse, including upland scrub sites, would be excluded from leasing. This would avoid potential impacts to Alabama beach mouse, nesting sea turtles, piping plover and other coastal special status species, including least tern, American oystercatcher, and Wilson's plover.</td><td colspan="2">Impacts from mineral development would be the same as Alternative 2, except the aquatic and wetland buffer would be reduced to 250-feet. In areas where slopes exceed 10 percent, the buffer could be extended up to 600-feet to provide adequate protection. In most cases, this buffer is expected to prevent construction activities from increasing the sedimentation of local drainages and wetlands. The coastal no lease areas would be replaced with a 600-foot NSO buffer. This change could affect nesting sea turtles, piping plover, and all critical habitat for Alabama beach mouse, including adjacent upland scrub habitats. Although no surface disturbance would occur on non-USFS FMO or BLM surface tracts, offsite directional drilling to target these Federal minerals would be permitted under this alternative.</td></tr>
<tr><td colspan="4">Wildland Fire and Ecology</td></tr>
<tr><td colspan="4">Fire response and fuels treatments would apply to the 159 acres of BLM-administered surface land. Wildland fire management would minimize damage to life, public safety, and developments in the wildland-urban interface (WUI) and to natural resource values. Allowing prescribed burning on a case-by-case basis would allow for a reduction in hazardous fuel conditions, improving ability to suppress wildfires while maintaining disturbance levels to which vegetation communities have adapted.</td></tr>
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(Preferred)</th><th>Alternative 4</th></tr>
<tr><td>Allowing vegetation manipulation to meet resources objectives and habitat improvements under standard management common to all alternatives would maintain natural fuel conditions across the surface tracts. This would maintain natural disturbance regimes and decrease the frequency and intensity of wildland fires and allow fires to be more easily controlled.
Dispersed recreation use would introduce additional ignition sources through human use of natural environments, which could increase the probability of wildland fire occurrence. This would be more prevalent in areas that are more accessible.
While ROW actions could increase suppression costs, the aspects of ROW related to vegetation clearing and the potential for increased accessibility could reduce suppression costs.</td><td colspan="2">Vegetative communities and fish and wildlife habitat management actions, such as removing invasive species and conducting prescribed fire, on the surface tracts would reduce the potential for changes in the vegetation communities from invasive species. As a result, the natural fire regimes would be maintained or restored. This would improve the ability to manage wildland fire in its natural role through application of prescribed fires.
The potential for increased wildland fire occurrence would decrease compared to Alternative 1 because travel on the surface tracts would be designated as closed or limited to motorized travel.
Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts would be managed as avoidance areas (a total of 114 acres or 71 percent BLM surface ownership in Alabama), there would be less potential for wildfire impacts associated with ROW development compared to Alternative 1.</td><td>Impacts from vegetative communities and fish and wildlife habitat management actions would be the same as Alternative 1.
Impacts from ROW and recreation and travel management actions would be the same as Alternative 2.
If tracts were transferred from Federal ownership, the responsibility for suppression of wildfires would be eliminated, decreasing suppression costs in wildland fire events.</td></tr>
<tr><td>Development of 20 oil and gas wells introduces additional ignitions sources throughout the non-USFS FMO, increasing the potential of wildland fire occurrence and introducing infrastructure that requires protection in wildland fire events. Disturbance associated with development could provide increased accessibility for fire suppression equipment, and provide fuel breaks. These impacts would not occur on the 8,179 acres closed to oil and gas development.</td><td>Impacts from minerals management would be the same as Alternative 1, except impacts would not occur on the 94,589 acres managed as NSO and in areas where development would be precluded (8,297 acres).</td><td colspan="2">Impacts from minerals management would be the same as Alternative 1, except impacts would not occur on the 43,239 acres managed as NSO and in areas where development would be precluded (8,179 acres).</td></tr>
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Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
Cultural Resources			
BLM would continue to protect cultural resources from disturbance, damage, or loss from authorized uses through project avoidance or mitigation, including data recovery if necessary. As inventories are conducted, more cultural sites would be identified. Inventories and adherence to law, regulation and policy would protect most cultural sites; however, inadvertent damage of undiscovered sites would remain a possibility.			
Dispersed recreation and standard vegetation treatments could result in inadvertent damage to cultural resources. Ground-disturbing activities associated with ROW construction and maintenance could impact cultural resources. Retaining surface tracts in Federal ownership (whether BLM administered or USFWS administered) would provide protection of cultural resource sites and preserve the setting of sites.	Vegetative communities and fish and wildlife habitat management would increase impacts to cultural resources due to implementing vegetation treatments to reduce invasive species and improve habitat. Limiting or closing motorized vehicle use on the surface tracts would increase protection of cultural sites. Impacts from retaining surface tracts in Federal ownership (BLM or USFWS) would be the same as Alternative 1. Managing the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts as avoidance areas for transportation and ROW would reduce the potential for impacts to cultural sites in these areas.	Impacts from surface tract management--including vegetative communities, fish and wildlife habitat, recreation, and ROW management actions--would be the same as Alternative 2. Making surface tracts available for disposal from Federal ownership could result in the removal of cultural properties from Federal ownership and the associated protections by laws, regulations and policies. However, applying conditions and restrictive covenants on management and use after disposal, damage to previously undetected cultural resources could be mitigated.	Impacts from vegetative communities and fish and wildlife habitat management actions would be the same as Alternative 1. Impacts from ROW and recreation and travel management actions would be the same as Alternative 2. Making the Coosa River, Fort Morgan Beach (Lots 13, 14, 24, 54 and 55), Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts available for disposal from Federal ownership could result in the removal of cultural properties from Federal ownership and the associated protections by laws, regulations and policies. Disposing the tracts without any specified management would increase the potential for damage or loss of previously undetected cultural resources after the transfer.
Minerals management actions could impact cultural resources. An appropriate level of cultural resource survey would need to be conducted prior to disturbance. Cultural resources on 8,179 non-USFS FMO acres closed to oil and gas leasing would be protected from oil and gas development.	Cultural resources on 8,297 non-USFS FMO acres closed to oil and gas leasing would be protected from oil and gas development, as would cultural sites on 94,589 non-USFS FMO acres managed for NSO.	Cultural resources on 8,179 non-USFS FMO acres closed to oil and gas leasing would be protected from oil and gas development, as would cultural sites on 43,239 non-USFS FMO acres managed for NSO.	
Based on the RFD, production of 37.6 million tons of coal from pre-existing underground mines over 20 years would not result in new surface disturbance; therefore, no impacts to cultural resources would be anticipated from coal development.			

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
Visual Resources			
Allowing recreation activities including motorized vehicle use on the surface tracts could result in decreased visual quality over time. If existing utility and road ROWs that bisect the Fort Morgan Highway and Jordan Lake tracts were expanded or otherwise modified, visual quality would be diminished through increased use of these ROWs.	Actions to improve vegetation communities and wildlife habitat would temporarily diminish visual quality; however, visual quality would be improved in the long term. Limiting motorized vehicle use on the surface tracts could diminish impacts described in Alternative 1. Managing the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts as avoidance areas for ROWs would help to retain the visual quality of the area by reducing the potential for development activities to occur in these areas. Managing the Fort Morgan Highway and Jordan Lake tracts as available for ROW corridors could diminish the visual quality of these areas.	Impacts from limiting motorized vehicle use and actions to improve vegetative communities and fish and wildlife habitat would be the same as Alternative 2. Although the Coosa River, Fort Morgan Beach (Lots 13, 14, 24, 54, and 55), Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts would be available for disposal from Federal ownership, visual quality would be protected.	Impacts from ROW and recreation and travel management actions would be the same as Alternative 2. Making the Coosa River, Fort Morgan Beach (Lots 13, 14, 24, 54, and 55), Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts available for disposal from Federal ownership could diminish visual quality, if the tracts were subsequently developed.
Mineral leasing and subsequent development in could result in the removal of vegetation; construction of access roads, well pads, and other infrastructure; introduction of drilling equipment; and associated dust emissions. These effects would all diminish the visual quality of the area.	Mineral leasing and subsequent development in could result in the removal of vegetation; construction of access roads, well pads, and other infrastructure; introduction of drilling equipment; and associated dust emissions. These effects would all diminish the visual quality of the area. Closed and NSO stipulations on 33 percent of the non-USFS FMO would prevent these impacts.	Mineral leasing and subsequent development in could result in the removal of vegetation; construction of access roads, well pads, and other infrastructure; introduction of drilling equipment; and associated dust emissions. These effects would all diminish the visual quality of the area. Closed and NSO stipulations on 16 percent of the non-USFS FMO would prevent these impacts.	
Minerals			
No impacts to oil and gas development would be anticipated from management of surface tracts.			
This alternative would have the least restrictions on oil and gas exploration and development, with more than 96 percent (305,6640 acres) of non-USFS FMO open to leasing, subject	Applying the conservation measures as lease stipulations and BMPs (Appendix D) could also increase exploration and development costs. This alternative would be the most	Applying the conservation measures as lease stipulations and BMPs (Appendix D) could also increase exploration and development costs. Compared to Alternative 2, lease stipulations would be less stringent under this alternative, with approximately 14 percent (43,239 acres) of non-USFS FMO open to leasing, subject to major constraints and less than 3 percent	

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
to the standard lease terms and conditions. The remaining 8,179 acres (approximately 4 percent) would be closed to leasing due to restrictions placed by other Federal surface management agencies. Oil and gas leasing stipulations would support development of the anticipated 20 wells on non-USFS FMO over the next 20 years.	restrictive on oil and gas exploration and development, with 30 percent (94,589 acres) of non-USFS FMO open to leasing, subject to major constraints and approximately 3 percent (8,297 acres) closed to leasing. The remaining 208,841 acres would be open to leasing, subject to the standard lease terms and conditions (37 percent of non-USFS FMO) or open to leasing, subject to minor constraints (29 percent of non-USFS FMO). Oil and gas leasing stipulations would support development of the anticipated 20 wells on non-USFS FMO over the next 20 years.	(8,179 acres) closed to leasing. The remaining 260,083 acres would be open to leasing, subject to the standard lease terms and conditions (45 percent of non-USFS FMO) or open to leasing, subject to minor constraints (37 percent of non-USFS FMO). Oil and gas leasing stipulations would support development of the anticipated 20 wells on non-USFS FMO over the next 20 years.	
Recreation and Travel Management			
Although Lots 73 and 74 of the Fort Morgan Beach tracts would be transferred to USFWS, these lots would remain within the boundaries of the Bon Secour NWR (where they are currently, but are not managed by the USFWS).			
Allowing motorized travel uses on all surface tracts could result in conflicts between motorized recreationists and recreationists seeking a more natural setting or experience. If existing ROW that bisect the Fort Morgan Highway and Jordan Lake tracts were expanded or otherwise modified, the recreation experience would be diminished. Retaining the surface tracts in Federal ownership would maintain access to recreational activity.	Actions to improve vegetative communities and fish and wildlife habitat would temporarily diminish the recreation experience. The recreation experience would be improved in the long term. Continuing to allow recreation use on the surface tracts would result in impacts similar to those described under Alternative 1. However, since motorized vehicle use would be limited or closed, more non-motorized recreation opportunities would be increased while there could be a loss of motorized recreation opportunities. Impacts from retaining the surface tracts in Federal ownership would be the same as Alternative 1.	Impacts from surface tract management--including vegetative communities, fish and wildlife habitat, recreation, and ROW management actions--would be the same as Alternative 2. Impacts from retaining the surface tracts in Federal ownership would be similar to Alternative 1. Although the Coosa River, Fort Morgan Beach (Lots 13, 14, 24, 54, and 55), Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts would be available for disposal from Federal ownership, recreational settings would be protected, although access could be reduced if not specifically included in the conditions for use or restrictive covenants.	Impacts from vegetative communities and fish and wildlife habitat management actions would be the same as Alternative 1. Impacts from ROW and recreation and travel management actions would be the same as Alternative 2. Making the Coosa River, Fort Morgan Beach (Lots 13, 14, 24, 54, and 55), Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts available for disposal from Federal ownership could reduce access for recreational opportunities.

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
	Managing the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts as avoidance areas for ROWs would help retain recreational opportunities. Making the Fort Morgan Highway and Jordan Lake tracts available for utility and road ROW corridors could diminish the quality of the recreation experience.		
Since approximately 105 acres of vegetation removal and construction activities would result from the development of 20 oil and gas wells on non-USFS FMO there could be a decrease in nature-based recreational opportunities due to conflicts with the developments. However, stipulations could indirectly protect the recreational resources in areas where development would be precluded (8,179 acres).	Impacts from minerals management would be the same as Alternative 1, except stipulations could indirectly protect the recreational resources on the 94,589 acres managed as NSO and in areas where development would be precluded (8,297 acres).	Impacts from minerals management would be the same as Alternative 1, except stipulations could indirectly protect the recreational and visual resources on the 43,239 acres managed as NSO and in areas where development would be precluded (8,179 acres).	
Lands and Realty			
Transferring Lots 73 and 74 of the Fort Morgan Beach tracts to the USFWS as part of the Bon Secour NWR would facilitate Federal management of the lots.			
Keeping the 159 acres of the surface tracts open to ROW applications would not impact the lands and realty program. Retaining the surface tracts under BLM administration would not allow for opportunities for other Federal agency or non-Federal ownership.	Managing the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (114 acres or 71 percent BLM surface ownership) as avoidance areas for ROWs could impose design and siting requirements and associated costs on new ROW or amended or renewed ROW at existing sites. There would be an increased potential for requests for new or amended and renewed ROW at existing sites to be denied. Making the Fort Morgan Highway and Jordan Lake tracts available for ROW would accommodate access and efficient energy supply, and minimize	ROW management actions and associated impacts to lands and realty would be the same as Alternative 2. The Coosa River and Fowl River tracts would be available for disposal with conditions. This would allow opportunities for other Federal agency or non-Federal ownership, but would restrict future use of the tracts. All of the Fort Morgan Beach and Fort Morgan Highway tracts would be available for transfer to the USFWS as part of the Bon Secour NWR. This would facilitate Federal management of the tracts, but would	ROW management actions and associated impacts to lands and realty would be the same as Alternative 2. The Coosa River, Fort Morgan Beach, Fort Morgan Highway, and Fowl River tracts would be available for disposal from Federal ownership with no restrictive covenants. This would allow for opportunities for other Federal agency or non-Federal ownership without specified conditions on future use of the tracts; however, disposal would not be allowed if it would jeopardize Federally-listed species or

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
	additional costs. Retaining the surface tracts under BLM administration and pursuing partnerships with other agencies and organizations could allow for management opportunities for other agencies and organizations, but would not allow for non-Federal ownership opportunities.	not allow opportunities for other Federal agency or non-Federal ownership. The Geneva and Jordan Lake tracts would be available for disposal from Federal ownership, which would allow for opportunities for other Federal agency or non-Federal ownership without specified conditions on future use of the tracts.	designated critical habitat, which could limit some disposals. The Geneva and Jordan Lake tracts would be available for disposal from Federal ownership, which would allow for opportunities for other Federal agency or non-Federal ownership without specified conditions on future use of the tracts.
Social and Economic			
Recreation and travel, fish and wildlife habitat, and vegetative communities management actions would not cause changes in the economic characteristics (employment, income, and industries) or quality of social assets (housing, education, values and attitudes). BLM lands would remain in Federal ownership. Lands and realty actions would not cause changes in the socioeconomic characteristics.	This alternative includes active invasive species management on three BLM land tracts. Impacts from these actions on the economic indicators would not be anticipated from these types of vegetation management actions. Stakeholders who value the protection of native vegetation and habitats will likely prefer this alternative over the other alternatives. Socioeconomic impacts from recreation and travel, lands and realty, and fish and wildlife management actions would be the same as those under Alternative 1 since minimal changes are anticipated.	Impacts from surface tract management--including vegetative communities, fish and wildlife habitat, and recreation and travel management actions--would be the same as Alternative 2. Under Alternative 3, a portion of the Fort Morgan Beach tracts would be transferred to the USFWS and a number of dispersed BLM surface land tracts would be available for disposal from Federal ownership with specified conditions on management and use after disposal to meet prescribed resource objectives. Since the types of activities on these lands are not likely to change considerably, there would be minimum impact to socioeconomic characteristics under this alternative. However, stakeholders who feel that the retention of Federal ownership is important to maintain preservationist and open space values might be negatively impacted by this alternative.	Recreation and travel, fish and wildlife habitat, and vegetative communities management actions would not cause changes in the economic characteristics (employment, income, and industries) or quality of social assets (housing, education, values and attitudes). Under Alternative 4, a portion of the Fort Morgan Beach tracts would be transferred to the USFWS and a number of dispersed BLM surface land tracts would be available for disposal from Federal ownership without conditions on management and use after disposal. Since development could be allowed on these properties, it is possible that the property tax revenues to the local counties would increase more than the Federal Payments in Lieu of Taxes, economically benefiting the counties and the state. It is possible that the private development of these tracts could slightly increase employment and income in these areas. Social indicators, such as housing, education, and cost of living are not expected to be influenced by the minimal development.

<table>
<tr><th>Alternative 1
(No Action)</th><th>Alternative 2</th><th>Alternative 3
(Preferred)</th><th>Alternative 4</th></tr>
<tr><td></td><td></td><td></td><td>Stakeholders who feel that the retention of Federal ownership is important to maintain preservationist and open space values will likely be negatively impacted by this alternative. Those stakeholders who feel the development of these lands is a better use of these surface tracts lands would likely prefer this alternative.</td></tr>
<tr><td>Since only 20 fluid mineral wells would likely be drilled with standard lease terms and conditions over the 20-year planning period, there would be minimal economic impacts from these activities. There would be minimal changes -- a potential slight increase in employment or income as compared with the current situation. Social indicators such as housing, education, and cost of living would not be anticipated to change under this alternative. Attitudes and values of some stakeholders are likely to be impacted by this alternative.</td><td>The same number of wells and acres of surface disturbance are anticipated under this alternative. This alternative provides for the most environmental stipulations on oil and gas leasing of these minerals. Economic and social indicators are likely to be similar to those under Alternative 1. There will be some impacts to stakeholders: stakeholders who believe that oil and gas leasing conditions should be imposed on development and production to mitigate environmental impacts would prefer this alternative to other alternatives; and the oil and gas industry and other stakeholders who believe in unconstrained Federal access to mineral development will least prefer this alternative.</td><td colspan="2">Socioeconomic impacts from minerals management will be similar those of Alternative 2. However, lease conditions are less restrictive than those under Alternative 2, but more restrictive than the standard lease terms under Alternative 1. Therefore, stakeholders that believe that oil and gas leasing conditions should be imposed on development and production to mitigate environmental impacts would likely prefer this alternative to Alternative 1. Since industry costs and availability for well pad locations will likely decrease under this alternative, oil and gas industry and other stakeholders who believe in unconstrained Federal access to mineral development will prefer Alternative 1 over this alternative.</td></tr>
<tr><td colspan="4">The anticipated amount of coal to be produced under this alternative for the next 20 years (1.9 millions tons per year) is consistent with coal development over the last ten years. Employment and compensation from BLM-administered mining provides for 677 employees with total mining employee compensation of $48,236,100. The average annual employee compensation is $71,218, compared with average annual compensation from all industries in the State of $34,877 (Bureau of Economic Analysis [BEA], 2005). Mining in the four-county study area likely provides fiscal revenues to local and state governments, supporting community and emergency services, school and infrastructure. Some stakeholders will support these mining activities due to the economic benefits in income, jobs, and government revenues, while others will be concerned that the economic benefit may not offset the risks to environmental and water resources from the activity.</td></tr>
<tr><td colspan="4">No impacts to Environmental Justice (EJ) populations are anticipated to occur.</td></tr>
</table>

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
Hazardous Materials			
BLM-authorized activities on surface tracts and non-USFS FMO could include hazardous materials, substances, and waste (including storage, transportation, and spills). These activities are conducted in compliance with 29 CFR 1910, 49 CFR 100-185, 40 CFR 100-400, CERCLA, RCRA, Superfund Amendment Reauthorization Act (SARA), Toxic Substances Control Act (TSCA), and the CWA and other Federal and State regulations and policies regarding hazardous materials management. Therefore, if any releases were to occur, it would be immediately addressed in accordance with regulation.			

Table 2-14. Comparison of Impacts For Mississippi

<table>
<tr><th>Alternative 1
(No Action)</th><th>Alternative 2</th><th>Alternative 3
(Preferred)</th><th>Alternative 4</th></tr>
<tr><td colspan="4">Air Quality</td></tr>
<tr><td colspan="4">Wildfire could lead to air emissions. Suppression of all fires would result in short term localized impacts, but not anticipated to deteriorate air quality conditions.</td></tr>
<tr><td>Management actions on the surface tract (174 acres), including potential ROW development and recreation and travel use, would not be anticipated to deteriorate air quality conditions.</td><td colspan="2">Although more management actions are proposed for the surface tract (174 acres), including vegetation and fish and wildlife habitat treatments, these actions would not be anticipated to deteriorate air quality conditions.
Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as an avoidance area, there would be less potential for emissions associated with ROW development compared to Alternative 1.</td><td>Impacts would be the same as Alternative 1, except managing the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) as an avoidance area would reduce the potential for emissions associated with ROW development compared to Alternative 1.</td></tr>
<tr><td colspan="4">Estimated emissions from development of 10 oil and gas wells on non-USFS FMO would be responsible for less than one tenth of one percent of emissions from the mineral development across Mississippi for NO$_x$, SO$_2$, PM$_{10}$, CO, and VOCs. Those emissions would likely occur over a dispersed geographic area and would therefore not cause any noticeable or measurable effect.
Potential oil and gas leasing on some non-USFS FMO tracts would be in close proximity to the Sipsey Wilderness in Alabama and the Breton NWR in Louisiana. Oil and gas emissions in those tracts could impact wilderness air quality values and ambient air quality attainment. Based on expected emissions air quality impacts would not be anticipated.</td></tr>
<tr><td colspan="4">Soil Resources</td></tr>
<tr><td>Management actions on the surface tract (174 acres), including potential ROW development and recreation and travel use, could impact soils through vegetation clearing activities and ground disturbance. Wind and water erosion, and subsequent loss in soil productivity would occur in disturbed areas where revegetation does not occur. These effects would be localized and short term in areas where revegetation is enhanced or permitted. The effect would be long term but localized if roads or structures were constructed on the tracts.</td><td colspan="2">Management actions proposed for the surface tract (174 acres), such as removing invasive species and conducting prescribed fire, could increase site-specific erosion in the short term. Over the long term, improving vegetation communities and fish and wildlife habitat would reduce erosion and overland flows.
Because the Hancock County tract would be retained in Federal ownership and management actions would afford more protections, such as NSO and avoidance areas for transportation and ROWs, no impacts would be anticipated.</td><td>Impacts would be the same as Alternative 1, except disposing the Hancock County tract to private or non-Federal ownership could result in potential development that could affect soils.</td></tr>
</table>

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
Oil and gas development activities could result in decreased soil productivity, disturb topsoils and surface soil characteristics, and increased surface runoff. Cut and fill areas to support well pads and access routes can contribute to local soil erosion. The estimated 10 wells to be developed in Mississippi over the life of this plan would disturb approximately 55 non-USFS FMO acres. Required reclamation and the minimal surface that might be disturbed would produce only localized effects on soils.	Anticipated levels of oil and gas development and associated impacts on 55 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (123 acres), and NSO (184,192 acres) restrictions would be implemented, which would reduce disturbance to soils within the protected areas. In addition to the stipulations in Appendix D, areas within 1,000-feet of aquatic habitats would be managed with an NSO stipulation, which would eliminate impacts to soils in these areas.	Anticipated levels of oil and gas development and associated impacts on 55 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (3,021 acres), and NSO (92,269 acres) restrictions would be implemented, which would reduce disturbance to soils within the protected areas. Under this alternative, the 1,000-foot NSO area around aquatic habitats identified in Alternative 2 would be reduced to 250-feet, which would reduce protections to soils within these areas.	
Water Resources			
Management actions on the surface tract (174 acres), including potential ROW development and recreation and travel use, could increase soil erosion and surface run-off, which increase nutrients levels and turbidity and decreases water quality. Impacts would be short term in areas where revegetation was enhanced or permitted. The effect would be long term but localized if roads or structures were constructed on the tracts. The hydric soils associated with the wetlands that encompass most of the tract could be affected by development or construction activities that would dredge or fill the wetlands, compacting soils and hindering natural flow through the wetlands and potentially resulting in the loss of these emergent wetlands.	Management actions proposed for the surface tract (174 acres), such as removing invasive species and conducting prescribed fire, could increase nutrient levels and turbidity and decrease water quality in the short term. Over the long term, these actions would maintain the emergent wetlands, water quality, and groundwater recharge. Because the Hancock County tract would be retained in Federal ownership and management actions would afford more protections, such as NSO and avoidance areas for transportation and ROWs, no impacts would be anticipated.		Impacts would be the same as Alternative 1, except disposing the Hancock County tract to private or non-Federal ownership could increase chances for subsequent development and associated impacts to water resources.

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
Except for 63,004 acres closed to leasing by other surface managing agencies, non-USFS FMO would be open to leasing subject to standard lease terms and conditions (454,930 acres). The estimated development of 10 wells on non-USFS FMO in Mississippi over the next 20-years would disturb approximately 55 acres. Required reclamation by Federal and State laws and the minimal surface that might be disturbed would produce only localized effects on water resources. Oil and gas development could result in surface run-off, which increases nutrient levels and turbidity and decreases water quality. Leakage of drill fluids, hazardous waste spills, or leakage from reserve pits could be introduced into the ground water as well. Additionally, access roads and well pads can alter the local hydrology reducing surface flow to mesic areas and diverting or degrading surface water.	Anticipated levels of oil and gas development and associated impacts on 55 acres would be the same as Alternative 1. A 1,000-foot NSO buffer around aquatic habitats and applying the stipulations in Appendix D would increase the area where seasonal, CSU (123 acres), and NSO (184,192 acres) restrictions would be implemented. This would reduce the level of impact to water resources within the protected areas.	Anticipated levels of oil and gas development and associated impacts on 55 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (3,021 acres), and NSO (92,269 acres) restrictions would be implemented, which would reduce disturbance to water resources within the protected areas. Under this alternative, the 1,000-foot NSO area around aquatic habitats identified in Alternative 2 would be reduced to 250-feet, which would allow development to occur in close proximity to water resources and the potential for impacts to water resources to occur.	
Vegetative Communities			
Surface-disturbing activities would result in vegetation-clearing activities and disturbance could affect plants in the sensitive wetland ecosystem, resulting in alteration of vegetation communities in the wetland ecosystem. Wind and water erosion in disturbed areas could impede the regrowth of wetland vegetation, allow noxious weeds to grow, and potentially impact water quality and species dependent on wetland habitat by changing the composition	Impacts from surface-disturbing activities would be reduced under this alternative compared to Alternative 1 due to limitation on motorized recreation, managing for enhancing and protecting coastal estuarine marsh ecosystem in support of the Mississippi Coastal Preserve System, and managing the tract as an avoidance area for transportation project ROWs. Impacts from retaining the tract in Federal ownership and pursuing partnerships to provide management would be the same as Alternative 1.		Impacts from surface-disturbing activities would be the same as Alternative 2. Disposing the surface tract out of Federal ownership without conditions for management and use after disposal could increase the potential for subsequent development and associated impacts to vegetation.

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
of habitat. Retaining the tract in Federal ownership would continue the application of protective measures by Federal law and agency policies that would protect wetland emergent vegetation communities.			
An estimated 10 wells to be developed in Mississippi over the life of this plan would disturb approximately 55 non-USFS FMO acres. Approximately 454,930 acres of non-USFS FMO estate in Mississippi as open to leasing subject to standard lease terms and conditions which could disturb, damage, demolish, or impact vegetation.	Impacts from fluid mineral leasing management actions on split estate would be the same as for Alternative 1. However, Alternative 2 uses more stringent leasing stipulations in managing all non-USFS FMO with exception, waiver, and modification criteria applied as determined through agency direction. Additional protections would be applied to 123 acres managed as CSU, 184,192 acres as NSO, and 63,004 acres closed to leasing.	Impacts under Alternatives 3 and 4 would be similar to those of Alternative 2 except protections would be applied to 3,021 acres managed as CSU, 92,269 acres as NSO, and 63,004 acres closed to leasing.	
Fish and Wildlife			
Surface-disturbing activities would result in vegetation-clearing activities and disturbance could affect could affect plants and species in the sensitive wetland ecosystem, resulting in the displacement of species and alteration of vegetation, habitat, and forage components important to wildlife, impairing species viability and reducing habitat quality for mussels, clams, and fish species in the wetland ecosystem. Wind and water erosion in disturbed areas could impede the regrowth of wetland vegetation, allow noxious weeds to grow, and potentially impact water quality and species dependent on wetland habitat by changing the composition of forage and habitat.	Impacts from surface-disturbing activities would be reduced under this alternative compared to Alternative 1 due to limitation on motorized recreation, managing for enhancing and protecting coastal estuarine marsh ecosystem in support of the Mississippi Coastal Preserve System, and managing the tract as an avoidance area for ROW. Impacts from retaining the tract in Federal ownership and pursuing partnerships to provide management would be the same as Alternative 1.		Impacts from surface-disturbing activities would be the same as Alternative 2. Disposing surface tract out of Federal ownership without conditions for management and use after disposal could increase the potential for subsequent development and associated impacts to vegetation and wildlife.

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
Retaining the tract in Federal ownership would continue the application of protective measures by Federal law and agency policies that would protect wetland emergent vegetation communities and associated habitat for various turtle species, fish, crab, and native and migratory birds, as well as many mammal species.			
An estimated 10 wells to be developed in Mississippi over the life of this plan would disturb approximately 55 non-USFS FMO acres. Approximately 454,930 acres of non-USFS FMO estate in Mississippi as open to leasing subject to standard lease terms and conditions which could disturb, damage, demolish, or impact wildlife.	Impacts from minerals management actions on split estate would be the same as for Alternative 1. However, Alternative 2 uses more stringent leasing stipulations in managing all non-USFS FMO with exception, waiver, and modification criteria applied as determined through agency direction. Additional protections would be applied to 123 acres managed as CSU, 184,192 acres as NSO, and 63,004 acres closed to leasing.	Impacts under Alternatives 3 and 4 would be similar to those of Alternative 2 except protections would be applied to 3,021 acres managed as CSU, 92,269 acres as NSO, and 63,004 acres closed to leasing.	
Special Status Species			
The lack of vegetation management actions could result in increased potential for invasive/exotic species becoming established or spreading. This is particularly true of the higher elevations of the Hancock County tract located on Point Clear Island. Cogon grass and Chinese tallow are both known to occur in the area and if uncontrolled could substantially alter the habitats supporting Mississippi diamondback terrapin and tiny-leaved buckthorn. No recreation management actions are planned. Because this tract is not accessible by road, few impacts are	Removing exotic invasive plant species, particularly cogon grass, could improve habitat conditions for the tiny-leaved buckthorn and Mississippi diamondback terrapin. Prescribed burns could be used to remove wood debris and flotsam left from Hurricane Katrina that create hazards for wildlife and degrade marshes. Limiting motorized use on the Hancock County tract to boating would avoid damaging of sensitive coastal habitats for tiny-leaved buckthorn and Mississippi diamondback. Impacts from retaining surface tracts in Federal ownership and pursuing partnerships to provide management would more directly benefit wildlife by restoring and maintaining continuity and composition of habitat than anticipated under Alternative 1.		Impacts from vegetative communities and fish and wildlife habitat management actions would be the same as Alternative 1. Impacts from recreation and travel and ROW management actions would be the same as Alternative 2. Under this alternative, the Hancock County tract would be available for disposal from Federal ownership. The affect this has on special status species is not known. Its location at the center of the Hancock County Marsh Preserve and the presence of extensive wetlands would make development of the tract difficult. It is

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
anticipated by designating the tract open to vehicles. However, use of four-wheelers on remote upland areas, such as Point Clear Island, could damage sensitive maritime forests and scrubs. Retaining the tract in Federal ownership would continue the application of protective measures by Federal law and agency policies that would protect special status species.			likely that special status species would continue to benefit from the tract being managed in coordination with the Mississippi Coastal Preserve System.
Oil and gas development on non-USFS FMO in Mississippi is expected to result in the direct loss of 55 acres. Based on previous oil and gas activity, the Federally listed species most likely to be affected are gopher tortoise, red-cockaded woodpecker, and black pine snake in the East Gulf Coastal Plain, and bald eagles associated with reservoirs and rivers in the northern portion of the state. Drilling in coastal areas would affect the 18 special status species that are associated with coastal marshes and maritime scrub and woodlands, including brown pelican, Wilson's plover, Mississippi diamondback terrapin and saltmarsh topminnow. Section 7 consultations with the USFWS would be required prior to BLM permitting any action that could adversely affect these Federally listed species or designated habitat, and subsequent actions would comply with the conditions established by any subsequent BOs.	Although the number of wells (10) and acres disturbed (55) would remain the same under this alternative, lease stipulations would shift surface disturbing activities away from sensitive habitats with potential to support special status species. In most cases, this is accomplished with NSO buffers or seasonal restrictions. These stipulations could be applied to 184,192 acres or about 36 percent of the non-USFS FMO in Mississippi.	The number of wells (10) and acres disturbed (55) would remain the same under this alternative and impacts would be the same as Alternative 2, except the aquatic and wetland buffer would be reduced to 250-feet. In areas where slopes exceed 10 percent, the buffer could be extended up to 600-feet to provide adequate protection. In most cases, this buffer is expected to prevent construction activities from increasing the sedimentation of local drainages and wetlands. The 600-foot no lease area along the coast, would be replaced with a NSO buffer. Although no surface disturbance would occur on non-USFS FMO or BLM surface tracts within this buffer, offsite directional drilling to target these Federal minerals would be permitted.	

<table>
<tr><th>Alternative 1
(No Action)</th><th>Alternative 2</th><th>Alternative 3
(Preferred)</th><th>Alternative 4</th></tr>
<tr><td colspan="4">Wildland Fire and Ecology</td></tr>
<tr><td colspan="4">Fire response and fuel treatments would apply to the 174 acres of BLM-administered surface land. Suppressing all wildland fires, unless an in-place site-specific plan determines otherwise, would minimize immediate threats and damage to life, public safety, and developments in the WUI and to natural resource values. Allowing prescribed burning on a case-by-case basis would allow for a reduction in hazardous fuel conditions, improving ability to suppress wildfires while maintaining disturbance levels to which vegetation communities have adapted.</td></tr>
<tr><td>Allowing vegetation manipulation to meet resources objectives and habitat improvements under standard management common to all alternatives would maintain natural fuel conditions across the surface tract. This would maintain natural disturbance regimes and decrease the frequency and intensity of wildland fires and allow fires to be more easily controlled.
Dispersed recreation use would introduce additional ignition sources through human use of natural environments, which could increase the probability of wildland fire occurrence. This would be more prevalent in areas that are more accessible.
While ROW actions could increase suppression costs, the aspects of ROW related to vegetation clearing and the potential for increased accessibility could reduce suppression costs.</td><td colspan="2">Vegetative communities and fish and wildlife habitat management actions, such as removing invasive species and conducting prescribed fire, on the surface tract would reduce the potential for changes in the marsh vegetation communities. The natural fire regimes would be maintained.
The potential for increased wildland fire occurrence would decrease compared to Alternative 1 because travel on the Hancock County tract would be limited to boating, decreasing accessibility to these areas and reducing the potential for additional ignition sources through increased human use.</td><td>Impacts from vegetative communities and fish and wildlife habitat management actions would be the same as Alternative 1.
Impacts from ROW and recreation and travel management actions would be the same as Alternative 2.
If tracts were transferred from Federal ownership, the responsibility for suppression of wildfires would be eliminated, decreasing suppression costs in wildland fire events.</td></tr>
<tr><td>Development of 10 oil and gas wells introduces additional ignitions sources throughout the non-USFS FMO, increasing the potential of wildland fire occurrence and introducing infrastructure that requires protection in wildland fire events. Disturbance associated with development could provide increased accessibility for fire suppression and</td><td>Impacts from minerals management would be the same as Alternative 1, except impacts would not occur on the 184,192 acres managed as NSO and in areas where development would be precluded (63,004 acres).</td><td colspan="2">Impacts from minerals management would be the same as Alternative 1, except impacts would not occur on the 92,269 acres managed as NSO and in areas where development would be precluded (63,004 acres).</td></tr>
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<table>
<tr><th>Alternative 1
(No Action)</th><th>Alternative 2</th><th>Alternative 3
(Preferred)</th><th>Alternative 4</th></tr>
<tr><td>provide fuel breaks. These impacts would not occur on the 63,004 acres closed to oil and gas development.</td><td></td><td colspan="2"></td></tr>
<tr><td colspan="4">Cultural Resources</td></tr>
<tr><td colspan="4">BLM would continue to protect cultural resources from disturbance, damage, or loss from authorized uses through project avoidance or mitigation, including data recovery if necessary. As inventories are conducted, more cultural sites would be identified. Inventories and adherence to law, regulation and policy would protect most cultural sites; however, inadvertent damage of undiscovered sites would remain a possibility.</td></tr>
<tr><td>Dispersed recreation and standard vegetation treatments could result in inadvertent damage to cultural resources.
Ground-disturbing activities associated with ROW construction and maintenance could inadvertently damage cultural resources.
Retaining surface tract in Federal ownership (whether BLM administered or USFWS administered) would provide protection of cultural resource sites and preserve the setting of sites.</td><td colspan="2">Vegetative communities and fish and wildlife habitat management would increase impacts to cultural resources due to implementing vegetation treatments to reduce invasive species and improve habitat.
Limiting motorized vehicle use on the surface tract to boating would increase protection of cultural sites.
Impacts from retaining surface tract in Federal ownership and pursuing partnerships would be the same as Alternative 1.
Managing the Hancock County tract as an avoidance area for ROW would reduce the potential for impacts to cultural sites.</td><td>Impacts from vegetative communities and fish and wildlife habitat management actions would be the same as Alternative 1.
Impacts from ROW and recreation and travel management actions would be the same as Alternative 2.
Making the Hancock County tract available for disposal from Federal ownership without any specified management or use conditions could have impacts if the property contained previously undetected, potentially eligible National Register of Historic Places (NRHP) cultural sites. Disposing the property from Federal ownership would remove the protection of any cultural resources under Federal law, and not applying management or use conditions would increase the potential for damage of previously undetected cultural resources.</td></tr>
<tr><td>Cultural resources on 63,004 non-USFS FMO acres closed to oil and gas leasing would be protected from oil and gas development.</td><td>Cultural resources on 63,004 non-USFS FMO acres closed to oil and gas leasing would be protected from oil and gas development, as would cultural sites on 184,192 non-USFS FMO acres managed for NSO.</td><td colspan="2">Impacts to cultural resources from management of non-USFS FMO would be the same as Alternative 2, except 359,640 acres would be managed as open to leasing subject to standard lease terms and conditions, 3,021 acres as CSU, 92,269 acres as NSO, and 63,004 acres as closed.</td></tr>
</table>

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
Visual Resources			
Allowing recreation activities including motorized vehicle use on the surface tract could result in decreased visual quality over time. If new ROW were approved on the Hancock County tract, visual quality would be diminished.	Actions to improve vegetation communities and wildlife habitat would temporarily diminish visual quality; however, visual quality would be improved in the long term. Limiting motorized vehicle use on the surface tract to boating could diminish impacts described in Alternative 1. Managing the Hancock County tract as an avoidance area for ROW would help to retain visual quality within the area by reducing the potential for development activities to occur in these areas.		Impacts from ROW and recreation and travel management actions would be the same as Alternative 2. Making the Hancock County tract available for disposal from Federal ownership without any specified management or use conditions could diminish visual quality, if the tract was subsequently developed.
Mineral exploration and development on non-USFS FMO tracts (517,934 acres) would result in impacts to visual resources on 55 acres from 10 wells. Removal of vegetation and construction of wells and well pads and introduction of other equipment would decrease visual quality. Impacts from these activities would not be anticipated on 63,004 acres closed to leasing.	Since approximately 55 acres of vegetation removal and construction activities would result from the development of 10 oil and gas wells (as with Alternative 1), impacts would be the same as Alternative 1. Stipulations applied under this alternative could protect visual resources on the 184,192 acres managed as NSO and in areas where development would be precluded (63,004 acres).	Since approximately 55 acres of vegetation removal and construction activities would result from the development of 10 oil and gas wells (as with Alternative 1), impacts would be the same as Alternative 1. Stipulations applied under this alternative could preclude oil and gas development thereby protecting visual resources on the 92,269 acres managed as NSO and in areas where development would be precluded (63,004 acres).	
Minerals			
No impacts to oil and gas development would be anticipated from management of surface tract.			
This alternative would have the least restrictions on oil and gas exploration and development, with approximately 88 percent (454,930 acres) of non-USFS FMO open to leasing, subject to the standard lease terms and conditions. The remaining 63,004 acres (approximately 12 percent) would be closed to leasing due to restrictions placed by other Federal surface management agencies. Oil and gas leasing stipulations would support development of the anticipated 10 wells on non-USFS FMO over the next 20 years.	Applying the conservation measures as lease stipulations and BMPs (Appendix D) could also increase exploration and development costs. This alternative would be the most restrictive on oil and gas exploration and development, with approximately 37 percent (184,192 acres) of non-USFS FMO open to leasing, subject to major constraints and approximately 12 percent (63,004 acres) closed to leasing. The remaining 270,615 acres would be open to leasing, subject to the standard lease terms and conditions	Applying the conservation measures as lease stipulations and BMPs (Appendix D) could also increase exploration and development costs. Compared to Alternative 2, lease stipulations would be less stringent under this alternative, with approximately 18 percent (92,269 acres) of non-USFS FMO open to leasing, subject to major constraints and approximately 12 percent (63,004 acres) closed to leasing. The remaining 359,640 acres would be open to leasing, subject to the standard lease terms and conditions (69 percent of non-USFS FMO) or open to leasing, subject to minor constraints (less than one percent of non-USFS FMO). Oil and gas leasing stipulations would support development of the anticipated 10 wells on non-USFS FMO over the next 20 years.	

<table>
<tr><th>Alternative 1
(No Action)</th><th>Alternative 2</th><th>Alternative 3
(Preferred)</th><th>Alternative 4</th></tr>
<tr><td></td><td>(51 percent of non-USFS FMO) or open to leasing, subject to minor constraints (less than one percent of non-USFS FMO). Oil and gas leasing stipulations would support development of the anticipated 10 wells on non-USFS FMO over the next 20 years.</td><td colspan="2"></td></tr>
<tr><td colspan="4">Recreation and Travel Management</td></tr>
<tr><td>Allowing recreation activities including motorized vehicle use on the Hancock County tract would maintain existing recreation and travel opportunities. However, allowing motorized travel could result in conflicts between motorized recreationists and recreationists seeking a more natural setting or experience.
The Hancock County tract would continue to be owned and managed by the University of Mississippi under an R&PP patent for the purposes of the R&PP patent, which would maintain access to recreational activity.
If a new road or utility ROW were authorized on the Hancock County tract the largely natural recreational experiences available would be diminished.</td><td colspan="2">Actions to improve vegetation communities and wildlife habitat would temporarily diminish or eliminate the recreation experience. The recreation experience would be improved in the long term.
Continuing to allow recreation use on the surface tract would result in impacts similar to those described under Alternative 1. However, since motorized vehicle use would be limited to boating, more non-motorized recreation opportunities would be increased while there could be a loss of motorized recreation opportunities.
Impacts from retaining the Hancock County tract in Federal ownership would be the same as in Alternative 1.
Managing the Hancock County tract as an avoidance area for ROW would retain the recreation experience in the undeveloped wetland setting.</td><td>Impacts from vegetative communities and fish and wildlife habitat management actions would be the same as Alternative 1.
Impacts from ROW and recreation and travel management actions would be the same as Alternative 2.
Making the Hancock County tract available for disposal from Federal ownership without any specified management or use conditions could result in reduced access for recreational opportunities. Following disposal, the tract could be made unavailable for public recreation.</td></tr>
<tr><td>Since approximately 55 acres of vegetation removal and construction activities would result from the development of 10 oil and gas wells on non-USFS FMO there could be a decrease in nature-based recreational opportunities due to conflicts with the developments. However, stipulations could indirectly</td><td>Since approximately 55 acres of vegetation removal and construction activities would result from the development of 10 oil and gas wells (as with Alternative 1), impacts would be the same as Alternative 1. Stipulations applied under this alternative could protect the recreational resources on the</td><td colspan="2">Since approximately 55 acres of vegetation removal and construction activities would result from the development of 10 oil and gas wells (as with Alternative 1), impacts would be the same as Alternative 1. Stipulations applied under this alternative could indirectly protect the recreational resources on the 92,269 acres managed as NSO and in areas where development would be precluded (63,004 acres).</td></tr>
</table>

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
protect the recreational resources in areas where development would be precluded (63,004 acres).	184,192 acres managed as NSO and in areas where development would be precluded (63,004 acres).		
Lands and Realty			
The 174-acre Hancock County tract would remain open to ROW applications; therefore, no impacts would be anticipated. Retaining the Hancock County tract under BLM administration would not allow for opportunities for other Federal agency or non-Federal ownership.	The 174-acre Hancock County tract would be managed as an avoidance area for ROW. This could impose design and siting requirements and associated costs on new ROW. There would be an increased potential for requests for new ROW to be denied. Retaining the Hancock County tract under BLM administration and pursuing partnerships with other agencies and organizations could allow for management opportunities for other agencies and organizations, but would not allow for non-Federal ownership opportunities.		ROW management actions and associated impacts to lands and realty would be the same as Alternative 2. The 174-acre Hancock County tract would be available for disposal from Federal ownership with no restrictive covenants. This would allow for opportunities for other Federal agency or non-Federal ownership without specified conditions on future use of the tract; however, disposal would not be allowed if it would jeopardize Federally-listed species or designated critical habitat, which could limit some disposals.
Social and Economic			
Recreation and travel, fish and wildlife habitat, and vegetative communities management actions would not cause changes in the economic characteristics (employment, income, and industries) or quality of social assets (housing, education, values and attitudes). Under this alternative, the Hancock County tract would remain in Federal ownership. Lands and realty management actions would not cause changes in the economic characteristics (employment, income, and industries) as there are very little changes anticipated under this alternative. Quality of social assets (demographics, housing, cost of	This alternative includes the removal of invasive species on the Hancock County tract. Impacts from these actions on the socioeconomic indicators would not be anticipated from these types of vegetation management actions. Stakeholders who value the protection of native vegetation and habitats will likely prefer this alternative over the other alternatives. Impacts to social and economic conditions would not be anticipated from recreation and wildlife management actions as there are very little anticipated changes in these actions. Impacts from lands and realty would be the same as those under Alternative 1.		Recreation, wildlife, and vegetative management actions would not cause changes in the economic characteristics (employment, income, and industries) or quality of social assets (housing, education, values and attitudes). Under Alternative 4, the Hancock County tract would be available for disposal from Federal ownership without conditions on management and use after disposal. Since development could be allowed on these properties, it is possible that the property tax revenues to the local counties would increase more than the Federal Payments in Lieu of Taxes, economically benefiting

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Preferred)	Alternative 4
living, education) in Hancock County are not likely to be affected by retaining these lands in Federal ownership. Some stakeholders would be impacted by these decisions.			Hancock County and the State. It is also possible that the private development of these tracts could slightly increase employment and income in these areas. Social indicators, such as housing, education, and cost of living are not expected to be influenced by the minimal development. Stakeholders who feel that the retention of Federal ownership is important to maintain preservationist and open space values will likely be negatively impacted by this alternative. Those stakeholders who feel the development of these lands is a better use of the Hancock County tract would likely prefer this alternative.
Since only 10 fluid mineral wells would likely be drilled with standard lease terms and conditions over the 20-year planning period, there would be minimal economic impacts from these activities. Social characteristics such as housing, education, and cost of living would not be anticipated to change as a result of this activity. Stakeholders who believe that oil and gas activity should be constrained to protect wetlands and aquatic habitat would likely feel that this alternative does not do enough to ensure protection of these types of resources. Additionally, oil and gas industry stakeholders as well as others who value maintaining access to Federal minerals for oil and gas development will likely prefer this alternative over the other alternatives.	The same number of wells and acres of surface disturbance is anticipated under this alternative. Therefore similar socioeconomic impacts will be experienced as those identified under Alternative 1. However, this alternative provides for the greatest number of lease constraints and conditions, including stipulations for well pad distance to wetland and aquatic resources at the Hancock County tract. Therefore, stakeholders who believe that oil and gas leasing conditions should be imposed on development and production to mitigate environmental impacts would prefer this alternative to other alternatives. Since industry costs and availability for well pad locations will likely decrease under this alternative, the oil and gas industry and other stakeholders who believe in Federal	The same number of wells and acres of surface disturbance is anticipated under this alternative. Therefore similar socioeconomic impacts will be experienced as those identified under Alternative 1. However, this alternative provides conditions on oil and gas leasing of these minerals, including stipulations for well pad distance to wetland and aquatic resources. These conditions are less restrictive than those under Alternative 2, but more restrictive than the standard lease terms under Alternative 1. Therefore, stakeholders who believe that oil and gas leasing conditions should be imposed on development and production to mitigate environmental impacts would likely prefer this alternative to Alternative 1. Since industry costs and availability for well pad locations will likely decrease under this alternative, oil and gas industry and other stakeholders who believe in unconstrained Federal access to mineral development will prefer Alternative 1 over this alternative.	

<table>
<tr><th>Alternative 1
(No Action)</th><th>Alternative 2</th><th>Alternative 3
(Preferred)</th><th>Alternative 4</th></tr>
<tr><td></td><td>access to mineral development will least prefer this alternative.</td><td colspan="2"></td></tr>
<tr><td colspan="4">No impacts to EJ populations are anticipated to occur; further evaluation is warranted at project implementation.</td></tr>
<tr><td colspan="4">Hazardous Materials</td></tr>
<tr><td colspan="4">BLM-authorized activities on surface tracts and non-USFS FMO could include hazardous materials, substances, and waste (including storage, transportation, and spills). These activities are conducted in compliance with 29 CFR 1910, 49 CFR 100-185, 40 CFR 100-400, CERCLA, RCRA, SARA, TSCA, and CWA and other Federal and State regulations and policies regarding hazardous materials management. Therefore, if any releases were to occur, it would be immediately addressed in accordance with regulation.</td></tr>
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CHAPTER 3—AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This chapter describes the existing physical, biological, cultural, social, and economic characteristics within the Bureau of Land Management's (BLM) planning area in the States of Alabama and Mississippi. Management of resources and resource uses on public lands and minerals administered by the BLM is directed by a variety of laws, regulations, policies, and other requirements (as specified in Appendix C). By describing existing conditions for resource programs in the planning area, this chapter serves as the baseline against which the impacts of the different alternatives are analyzed and compared.

3.1.1 How to Read This Chapter

This chapter is divided into four sections:

- **Introduction (Section 3.1)**—This section presents an overview of the chapter and provides direction on How to Read This Chapter (Section 3.1.1).
- **Alabama Statewide Perspective (Section 3.2)**—Oil and gas leasing of BLM-administered non-United States Forest Service (USFS) Federal mineral ownership (FMO) could occur anywhere in the State; therefore, a statewide perspective is needed to cover the full geographic range for the environmental baseline. This statewide discussion is organized by resource according to the *BLM Land Use Planning Handbook* (H-1601-1).
- **Alabama Surface tract Description (Section 3.3)**—This section provides available information specific to each of the surface tracts in Alabama: the Coosa River tracts, Fort Morgan Beach tracts, Fort Morgan Highway tracts, Fowl River tract, Geneva tract, and Jordan Lake tract (as described in Chapter 2).
- **Mississippi Statewide Perspective (Section 3.4)**—Oil and gas leasing of BLM-administered non-USFS FMO could occur anywhere in the State; therefore, a statewide perspective is needed to cover the full geographic range for the environmental baseline. This statewide discussion is organized by resource according to the *BLM Land Use Planning Handbook* (H-1601-1).
- **Mississippi Surface tract Description (Section 3.5)**—This section provides available information specific to the Hancock County tract in Mississippi (as described in Chapter 2).

3.2 ALABAMA STATEWIDE PERSPECTIVE

3.2.1 Air Quality

Alabama is located in a humid, subtropical climatic region characterized by temperate winters; long, hot summers; and an evenly distributed annual rainfall. The region, however, is subject to periods of drought and flood—its climatic conditions are rarely average. A feast-or-famine situation attributed to weather conditions is typically expected as the climate delivers energy and moisture in subtropical latitudes between a large landmass to the north and the Gulf of Mexico to the south (Southeastern Regional Climate Center 2005).

Typical mean annual temperatures range from 60°F in the north to 70°F along the coast. Temperatures regularly exceed 100°F at many places in Alabama and drop to zero or lower about once a year. Freezing temperatures reach the gulf coast almost every winter. Normal precipitation ranges from 50 to 65 inches across the State (NOAA 2007a).

Air Quality Meteorology

Surface wind speeds are variable depending on terrain and proximity to the coast. Average wind speeds vary from 6 to 10 miles per hour in most locations and follow water drainage features of the land or are driven by sea breezes. Dispersion can also be related to the National Oceanic and Atmospheric Administration (NOAA) Stagnation Index, which primarily focuses on ozone (NOAA 2005). On the basis of this index, Alabama was prone to air stagnation for 25 to 50 percent of the days from May through September of 2002 – 2004. This dispersion index compares moderately to other areas in the country.

Baseline Air Quality

Ambient Air Quality. The Environmental Protection Agency (EPA) has established ambient air quality standards for criteria pollutants considered harmful to public health and the environment. The ambient air quality measurements in Alabama for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), ozone (O_3), and particulate matter (PM_{10} and $PM_{2.5}$) are shown in Table 3-1. Ambient air quality measurements made by the Alabama Department of Environmental Management (ADEM) indicate that ambient air quality is within the standards, except for carbon monoxide, particulates, and ozone in Birmingham, Alabama (Shelby and Jefferson Counties), and particulates in Russell County (near Columbus, Georgia). Ozone is formed from the chemical reactions of nitrogen oxides, volatile organic compounds (VOCs), and sunlight. Several Alabama locations exceed the ambient air quality standards.

Table 3-1. Recent Highest Ambient Air Quality Measurements in Alabama[1, 2]

Pollutant	Averaging Time	Highest Measured Value (ppm[3])	Location	National Ambient Air Quality Standard (ppm[3])
SO_2	1 year	0.004	Jefferson County	0.03
	24 hours	0.020	Jefferson County	0.14
	3 hours	0.046	Jefferson County	0.50
NO_2	1 year	0.008	Helena	0.053
CO	8 hours	25.1	North Birmingham	9
	1 hour	36.9	North Birmingham	35
O_3	8 hours	0.102	Shelby County	0.080
	1 hour	0.140	Arrant City	0.120
PM_{10}	1 year	38 µg/m^3	Birmingham	50 µg/m^3
	24 hours	185 µg/m^3	Birmingham	150 µg/m^3
$PM_{2.5}$	1 year	21.5 µg/m^3	Jefferson County	15 µg/m^3
	24 hours	57 µg/m^3	Wylam	65 µg/m^3

1 ADEM Annual Air Quality Report 2001 (ADEM 2002).
2 Three-year averages for 1999 through 2003 found at www.adem.state.us/AirDivision/AirDivision.htm (ADEM 2005).
3 ppm = parts per million

Visibility and Atmospheric Deposition. Visibility and atmospheric deposition measurements are not available for Alabama.

Area Air Quality Designations

Prevention of significant deterioration (PSD) of areas meeting the ambient air quality standards are divided into the following three categories—Class I for areas of restricted growth, Class II for areas of moderate growth, and Class III for industrialized areas (Clean Air Act of 1977, as amended). All of Alabama is designated as PSD Class II, except for the Sipsey Wilderness in northwest Alabama, which is Class I, and the areas listed previously that did not meet National Ambient Air Quality Standards (NAAQS) and are unclassified. Other Class I areas (within 100 kilometers of the potential development activities) include the Breton National Wildlife Refuge (NWR) off the coast of Louisiana, St. Marks NWR in the Florida Panhandle (each managed by the U. S. Fish and Wildlife Service [USFWS]), Cohutta Wilderness Area in northern Georgia, and Bradwell Bay Wilderness Area in the Florida Panhandle (each managed by USFS).

3.2.2 Soil Resources

Physiographic Regions and Soil Types

Alabama can be divided into four major physiographic regions—Coastal Plain, Piedmont, Valley and Ridge, and Appalachian Plateau (Highland Rim and Cumberland Plateau). Each physiographic region is described in Appendix F.

Soil formation and character are all determined by parent material, surface slope, climate, biological activity, and time. Because Alabama is located within the humid subtropics, its soils are transitional between the cool climatic regions and the tropics. Podzolization, a soil-forming process of humid cool climates, and laterization, a soil-forming process of lowland tropics, are represented by the red and yellow podzolic soils and reddish-brown lateritic soils in Alabama. The State has seven major soil areas, including limestone valleys and uplands, Appalachian Plateau, Piedmont Plateau, prairies, coastal plains, major flood plains and terraces, coastal marshes, and beaches (Mitchell 2004). A brief description of the major parent soil units and their locations in Alabama is provided in Appendix F.

The characteristics of soils in BLM-administered non-USFS FMO areas are described in Appendix F.

Prime and Unique Farmlands

The Farmland Protection Policy Act requires the identification of proposed actions that would affect any lands classified as prime and unique farmlands. The U. S. Natural Resources Conservation Service (NRCS) administers this act to preserve farmland.

Prime farmland is defined as having the availability and best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Its soil quality, growing season, and moisture supply can produce economically sustained high yields of crops when treated and managed according to acceptable farming methods, including water management. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. The land is permeable to water and air. Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they neither flood nor require protection from flooding.

Prime farmlands occur in dispersed areas across Alabama. Counties in Alabama with areas having high potential for oil and gas or coal development likely include soil units that have been identified as prime farmland by NRCS. Appendix F includes prime farmland classification information that is available for soils within non-USFS FMO.

3.2.3 Water Resources

Surface Water

Alabama is divided into 14 major river basins containing 77,272 miles of rivers and streams (47,072 miles of perennial rivers and streams and approximately 30,200 miles of intermittent streams). These 14 basins are the Tennessee, Upper Tombigbee, Lower Tombigbee, Black Warrior, Coosa, Cahaba, Tallapoosa, Chattahoochee, Choctawhatchee, Chipola, Perdido-Escambia, Alabama, Mobile, and Escatawpa River Basins (ADEM 2004) (Map 3-1). Appendix H briefly describes each major river basin. Alabama has ponds, lakes, and reservoirs in excess of 490,472 acres. Freshwater wetlands occupy an estimated 3.6 million acres (ADEM 2004).

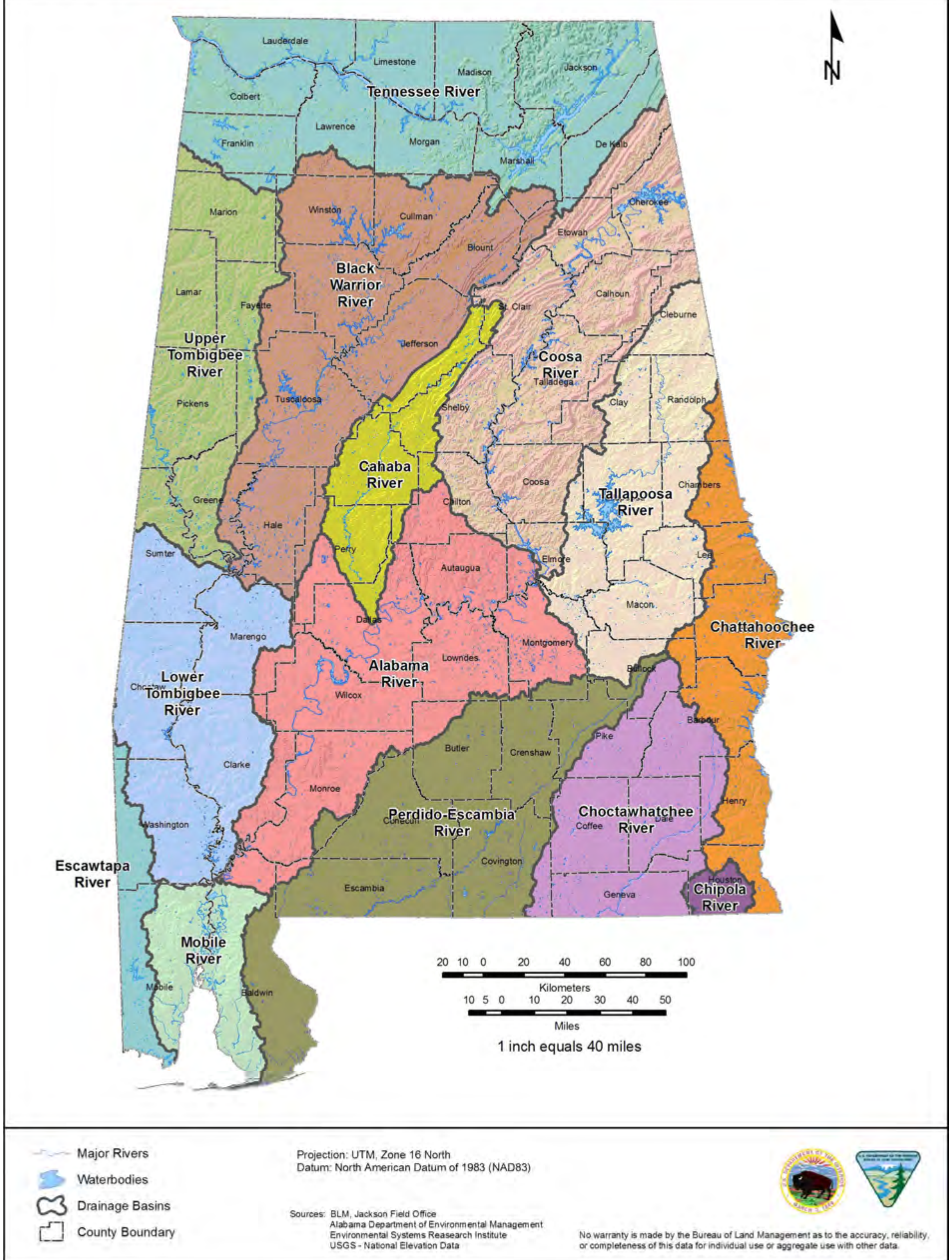
Alabama’s surface water is generally of high quality. An indication of full-use support (i.e., meeting established water quality criteria for its designated use classification) of rivers and streams can be found in Alabama’s Final 2004 §303(d) List, as presented in ADEM 2004. As of 2004, Alabama has a high percentage of full-use support for rivers and streams.

Similarly, Alabama’s publicly accessible lakes and reservoirs have 82.6 percent full-support status. However, much of the nonsupport acreage is related to historical, as well as recent, polychlorinated biphenyl (PCB) contamination (primarily from industrial point sources in the Upper Coosa River) and eutrophic conditions in the Coosa River Basin reservoirs. Naturally higher nutrients in Coosa River Basin soils largely dictate the eutrophic conditions of the basin’s reservoirs (ADEM 2004). Several lakes and reservoirs are considered to be degrading in the Coosa River Basin, including the Neely Henry, Logan Martin, Lay, Mitchell, and Jordan. These reservoirs are characterized by increases in nutrient concentrations; implementation of fish tissue consumption advisories; increases in undesirable algal species; and violations of water quality standards, or a combination thereof (ADEM 2003). Several of BLM’s Coosa River tracts (Foshee Island, Little Rock Island, Big Rock Island, and Gilchrist Island) are within Mitchell Lake. One of BLM’s Coosa River (Jordan Lake) surface tracts is located approximately 10 river miles upstream from Jordan Lake and about 5.5 miles downstream from Mitchell Lake. The Coosa River tract at Smith Island is located about 10 miles upstream from Lay Lake. The Coosa River tract at Prince Island is located approximately 11 river miles upstream from Lay Lake.

About 25 river miles in Alabama are within BLM-administered non-USFS FMO areas. Eight river miles flow over areas with potentially high mineral development prospects. Oil and gas leases exist on a total of about 0.6 river miles. The Cahaba River Basin is of particular interest, as there are nine leases in this area and there is renewed interest in coalbed methane natural gas production. Approximately 2,060 lake acres occur within non-USFS FMO areas. National Wetland Inventory (NWI) data are limited for Alabama. Because of the lack of available digital data for freshwater wetlands in Alabama, non-USFS FMO acreage within freshwater wetland areas in the State could not be estimated.

Map 3-1: Major Drainage Basins of Alabama

Alabama-Mississippi RMP-EIS



Projection: UTM, Zone 16 North
Datum: North American Datum of 1983 (NAD83)

Sources: BLM, Jackson Field Office
Alabama Department of Environmental Management
Environmental Systems Reasearch Institute
USGS - National Elevation Data

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

Ground Water

Alabama has 19 major aquifers and aquifer systems that supply drinking water to about 44 percent of the State's total population using a public water supply (an additional 6 percent use private wells) (ADEM 2003). The lack of chronic pollutants in public water supply ground water sources is a good indication of Alabama's high quality ground water and effective resource management (ADEM 2004).

Precipitation is the sole source of water for the ground water system, but only a small part of the annual precipitation actually recharges the ground water system. Because the recharge of aquifers entirely depends on precipitation, natural ground water levels in Alabama follow the same pattern of seasonal fluctuation as precipitation (USGS 2003). Information on major ground water recharge zones in Alabama was not available for evaluation relative to non-USFS FMO.

Coastal Zone

The National Coastal Zone Management (CZM) Program is a voluntary partnership between the Federal government and U. S. coastal states and territories authorized by the Coastal Zone Management Act of 1972. The Coastal Programs Division, within NOAA's Office of Ocean and Coastal Resource Management, administers the program at the Federal level and works with State CZM partners. Alabama's Coastal Area Management Program (ACAMP) was approved and has been in effect since 1979. The program regulates various activities on coastal lands and waters seaward of the continuous 10-foot contour in Baldwin and Mobile Counties of Alabama. The Fort Morgan Beach and Highway tracts in Baldwin County in addition to BLM-administered non-USFS FMO fall within the ACAMP.

Alabama's coastal wetlands are estimated at 27,600 acres (NWI estimates, as presented in ADEM 2004). Coastal Alabama also has an estimated 610 square miles of estuaries and a coastal shoreline that is 337 miles long (including Mobile Bay and island shorelines) (ADEM 2004).

EPA has identified the Mobile Bay coastal drainage as a wetland restoration priority area. EPA's Gulf of Mexico program has also identified the Mobile Bay area as a priority for water quality and habitat improvement projects (ADEM 2004). In 2000, ADEM's coastal programs received a wetlands restoration grant to implement restoration strategies and address State lands within ADEM's Alabama Coastal Nonpoint Source Pollution Control Program's (ACNPCP) management area, which includes all of Mobile and Baldwin Counties. The project has targeted restoration and protection of priority tracts in the approximately 5,000 acres of wetlands in Baldwin County. ADEM identified the Bon Secour Bay and Fort Morgan Peninsula as priority candidate wetlands restoration sites (ADEM 2004). USFWS is the technical adviser to projects conducted under the wetlands restoration grant.

Wetland types in Baldwin County include riverine (overbank flooding of associated rivers and streams); fringe (shoreline of coastal ecosystems, marshes); flat (wet pine flats, pine savannas, and pitcher-plant bogs); and depressional (ponds, interdunal swales) (ADEM 2004). On the basis of a rough geospatial analysis, about 5,850 acres of BLM-administered non-USFS FMO are within coastal wetland areas in Alabama.

3.2.4 Vegetative Communities

For this planning effort, Gap Analysis Program (GAP) was used to delineate land cover types on non-USFS FMO in Alabama. This land cover map is based on Landsat-7 satellite imagery using the National Land Cover Data (NLCD), which includes 21 very broad land cover classifications. The decision to use this data set was based on its statewide application and availability in a geographical information system format at the time this planning effort was initiated. Analysis of the GAP land cover map resulted in the identification of seven dominant cover types on non-USFS FMO lands in Alabama. These cover types include deciduous (25 percent); mixed (23 percent); evergreen (19 percent); wetland forest/shrubland (10 percent); pasture/hay (8 percent); row/crops (5 percent); and open water (2 percent). Less dominant cover types (approximately 8 percent) are not discussed further. The following brief discussions provide an overview of the cover types found on non-USFS FMO in Alabama.

- **Deciduous (25 percent)**—This classification is dominated by trees, of which 75 percent or more are hardwoods. Common trees in these areas include a wide variety of oak (*Quercus spp.*) and hickory (*Carya spp.*) species; red maple (*Acer* rubrum); ash (*Fraxinus spp.*); hackberry (*Celtis laevigata*); yellow poplar (*Liriodendron tulipifera*); beech (*Fagus grandifolia*); elm (*Ulmus spp.*); sweetgum (*Liquidambar styraciflua*); persimmon (*Diospyros virginiana*); and black cherry (*Prunus serotina*).
- **Mixed (23 percent)—**This classification delineates areas where neither hardwood nor pine species represent more than 75 percent of the cover. These mixed hardwood/pine areas are typically dominated by loblolly (*Pinus taeda*); longleaf pine (*Pinus palustris*); slash pine (*Pinus elliottii*); or shortleaf pine (*Pinus echinata*), with a wide variety of oak and hickory species, plus hackberry, elm, sweetgum, common persimmon, and yellow poplar.
- **Evergreen (19 percent)—**This classification delineates areas where 75 percent or more of the tree species are evergreen. In Alabama, the dominant pine species are loblolly, longleaf pine, slash pine, and shortleaf pine. This classification includes commercial pine plantations, which according to the Alabama Comprehensive Wildlife Conservation Strategy (CWCS) comprised 24 percent of the forested acreage in Alabama in 2000. Loblolly is the most commonly planted pine species. An additional species, sand pine (*Pinus clausa*) dominates a narrow band of scrub habitats behind the coastal dune systems along the Gulf of Mexico.
- **Wetland Forest/Shrubland (10 percent)—**This classification comprises areas in which forest or shrubland vegetation accounts for 25 to 100 percent of the cover and the soil or substrate is periodically saturated or covered with water. These encompass diverse communities ranging from forested wetlands, bald cypress (*Taxodium distichum*) swamps, to bogs and coastal marshes. Dominant species in seasonally flooded forests are sweet bay (*Magnolia virginiana*), sweetgum, wax myrtle (*Myrica cerifera*), various oaks, and titi (*Cyrilla racemiflora*). Typical wetland or bog species include pitcher plants, various rushes, sedges, arrowhead, and St. John's wort (*Hypericum spp.*). Typical species of coastal wetlands and marshes include sawgrass (*Cladium spp.*), black needlerush (*Juncus roemerianus*) and bulrush (*Scirpus spp.).*
- **Pasture/Hay (8 percent)—**Vegetation in this community is composed of introduced grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of hay crops.
- **Row/Crops (5 percent)—**This classification includes areas being actively cultivated.
- **Open Water (2 percent)—**This classification includes areas with less than 25 percent cover of vegetation/land cover.

Alabama Invasive/Exotic Species

The Alabama Invasive Plant Council lists 45 invasive plants as occurring in the State. The top ten include Chinese tallow (*Triadica sebifera*); Chinese privet (*Ligustrum sinense*); multiflora rose (*Rosa multiflora*); tropical soda apple (*Solanum viarum*); Japanese climbing fern (*Lygodium japonicum*); kudzu (*Pueraria montana var. lobata*); cogongrass (*Imperata cylindrica*); hydrilla (*Hydrilla verticillata*); alligator weed (*Alternanthera philoxeroides*); and Eurasian milfoil (*Myriophyllum spictum*). The most likely to be encountered on non-USFS FMO are Chinese tallow, Chinese privet, and cogon grass. Cogon grass, in particular, has the potential to affect future land use practices because of its ability to alter natural fire regimes, its thick growth habit that excludes other vegetation and the difficulty to control it. Chinese privet is a common invasive plant that occurs along edges and disturbed sites. Chinese tallow tree is often found near or in wetlands, and along fence rows and roads.

3.2.5 Fish and Wildlife

Game Species

Alabama's major game species include whitetail deer (*Odocoileus virginianus)*, eastern turkey (*Meleagris gallapavo silvestris*), mourning dove, northern bobwhite quail, squirrel and waterfowl species. Alabama held its first alligator hunt since the recovery of the species in 2006. The whitetail deer population in Alabama was estimated at 1.75 million in 2000, up from an estimated 2,000 in the early 1900s, due in part to major restocking efforts during the 1950s and 1960s. The Alabama Wildlife and Freshwater Fisheries Division estimates the current population of eastern wild turkey at 350,000. Turkey prefer hardwood and mixed pine-hardwood forestlands interspersed with open areas in both upland and bottomland regions. Mourning doves are common throughout the State on farms, and in towns, woodlots, agricultural fields, and grasslands. Quail occurrence is incidental across the State, generally associated with abandoned weedy fields and open pinelands or savanna with extensive groundcover of forbs, native grasses, and scattered brush thickets. Gray squirrel (*Sciurus carolinensis*) and fox squirrel are both found statewide. The gray squirrel is common in hardwood forests, mixed forests, and urban areas. The less common fox squirrel favors mature deciduous and pine-oak woodlands, but also occurs at forest edges and in riparian woodlands. Twenty-six species of ducks are found in the coastal and inland waters of Alabama. The wood duck (*Aix sponsa*) and the hooded merganser (*Mergus cucullatus*) occur Statewide throughout the year and breed extensively in Alabama. As part of the Mississippi Flyway Alabama provides important winter habitat for waterfowl that are produced in the Prairie Pothole Region and Great Lakes States. Alabama provides varied and abundant sport fishery with 26 game species. Reservoirs, ponds, lakes and swamps throughout the State provide important habitats for sport fishes.

Neotropical Migratory Birds

The Alabama Ornithological Society State list includes 420 species of birds known to occur in the State. A total of 178 species are known to breed in Alabama, including 158 species that regularly breed in the State. Additionally, 174 species regularly winter in and 80 species migrate through Alabama. This list also contains 38 accidental, three extinct, two extirpated (no longer occurring in Alabama, but may occur in other States), and four exotic (non-native) species. Maritime forests and shrub lands along coastal Alabama provide important staging areas for migrating songbirds and hawks, and are critical when weather in inclement or when exhausted birds make landfall.

3.2.6 Special Status Species

For the purposes of this document, special status species are defined as all Federally- and State-listed, species proposed or candidates for Federal or State listing, and those species identified by BLM as sensitive species. BLM Eastern States policy designates as "BLM sensitive" those additional species that are considered to be critically imperiled (S-1) or imperiled (S-2) by the State Natural Heritage programs. The USFWS currently lists 130 Federally-listed species which historically or currently occur in Alabama. The Alabama Natural Heritage Program (ANHP) inventory lists 712 species ranked as either critically imperiled (S-1) or imperiled (S-2) being tracked in the State in 2006. A complete list of S-1 and S-2 species being tracked by ANHP is included in Appendix E. Much of the following discussions are based on the Alabama CWCS, which includes a complete list of the wildlife species of conservation concern in the State.

This discussion of special status species takes a statewide perspective, even though management of BLM's scattered surface acreage and oil and gas development would probably directly affect less than 264 acres in total. Oil and gas leasing of non-USFS FMO in particular could occur anywhere in the State, and future oil and gas development has the potential to affect aquatic systems downstream from locations substantially increasing the area potentially affected. Therefore, a statewide perspective is needed to cover the full geographic range of potential impacts.

Overview

The high number of special status species in Alabama is a factor of the State's exceptional biodiversity, high rate of endemism, and a history of impacting land uses in the State. Physiographically, the State crosses five provinces: Interior Plateau, Southwestern Appalachians, Ridge and Valley, Piedmont and East Gulf Coastal Plain, and is situated at the periphery of many species' ranges (see Section 3.4.2). It is also a well-known global hotspot for aquatic biodiversity. Alabama surpasses all eastern States in plant and animal diversity, ranking fifth in the nation after California, Texas, Arizona, and New Mexico (ANHP 2003). Alabama ranks first in the nation in freshwater species diversity. Of the 307 species of freshwater mussels recorded in the nation, 180 have been recorded in Alabama. The Nature Conservancy has ranked the Tennessee River and the Mobile River, including its major tributaries, the first and second most biologically diverse rivers in the country.

This diverse fauna is affected by a history of impacting land uses. Most of Alabama's larger rivers are impounded for navigation, hydropower, and flood control, resulting in the loss of many aquatic species during this century. The Black Warrior River Basin is the largest coal-producing area in the South and coalbed methane production is among the highest in the nation (Alabama Oil and Gas Board), and the river system has been degraded by past coal mining, gas development and other uses. Throughout the State, aquatic systems have been adversely affected by intensive silviculture and urbanization. Longleaf pine, once the State's most abundant tree (Harper 1928), was reduced to 732,800 acres by 2000 (Hartsell and Brown 2002). In the Southeast, longleaf pine forests now exist on only 3 percent of their previous range (Frost 1993). Throughout much of its range, these longleaf sites have been converted to loblolly pine or slash pine for commercial production and/or degraded by the absence of fire, to the detriment of many terrestrial species associated with this once widespread habitat. These factors have contributed to Alabama having more wildlife species at risk than any State east of the Colorado River. Only Hawaii, California, and Nevada have more imperiled species, and only Hawaii has lost more species to extinction (Stein 2002). At least 108 animal species: 47 mussels, 44 aquatic snails, 11 fishes, five birds, and four mammals have been extirpated in the State (Alabama CWCS). Of the 117 Federally-listed species in Alabama, 70 percent are associated with freshwater aquatic or wetland habitats.

There is non-USFS FMO in both major oil and gas producing regions of Alabama: the Black Warrior River Basin Region and the Southwest Alabama Region, and both of these regions have substantial special status species issues. The Black Warrior River Region includes the Black Warrior and Tombigbee Rivers and the upper portions of the Cahaba River, all part of the Mobile River basin. Forty-two fish species have been identified as endemic to the basin, and according to the Alabama Natural Heritage 2006 Tracking List, there are now 35 aquatic species either Federally-listed or considered imperiled or critically imperiled in the Black Warrior basin alone. The Southwest Alabama Region includes the Conecuh, Mobile, Escatawpa, Perdido, and Blackwater River basins. These basins support 26 special status aquatic animal species, including the Federally-listed Alabama sturgeon and Gulf sturgeon. Uplands in this area contain almost 90 percent of the longleaf pine acreage, both natural and planted, remaining in the State (Hartsell and Brown 2002). Eighteen special status species are associated with this once widespread habitat (Alabama CWCS), including keystone species such as the red-cockaded woodpecker and gopher tortoise. Coastal areas in Mobile and Baldwin counties support ten special status species, including critical habitat for Alabama beach mouse, nesting habitat for loggerhead sea turtle, and critical habitat for wintering piping plover.

Outside of these producing oil and gas regions, there is non-USFS FMO in all but ten southeastern counties in Alabama. Future development in these areas could occur in response to new finds or new technology that makes recovery of the oil/gas more economical. For instance, recently there have been new wells drilled on private minerals in St. Clair and Etowah Counties. These counties are located in the Coosa River Basin, the largest and most biologically diverse portion of the Mobile River Basin, with 39 special status species. Nine of these are considered to be extirpated from this river basin and an additional four are considered to be extirpated from the State.

On non-USFS FMO across the State there are a number of small, often isolated high-value habitats that support special status species. These include many wetland communities such as bogs, seeps, and swamps, prairie and glade openings and karst habitats. BLM-administered non-USFS FMO has been estimated to include 38,898 acres of shrub and forested wetlands at least periodically inundated. There are 12 special status amphibians found in the State that utilize these habitats. There are also a number of plant species restricted to these habitats, including the green pitcher plant and white fringeless orchid, both candidates for Federal listing. Glades, in the northeastern half of the State and prairies in the “Black Belt” areas are scarce in this forest dominated State and tend to support rare assemblages of plants. Karst areas in the northeastern portion of the State support a high number of endemic species. In Jackson County, caves support 24 species found nowhere else and caves in Morgan and Madison counties are designated as National Natural Landmarks.

Species Accounts

The following Federally-listed or candidate species are known to occur or to have potential to occur on BLM non-USFS FMO. There are currently no species proposed for Federal listing in Alabama (Natureserve 2006). A list of species ranked by ANHP as critically imperiled (S-1) or imperiled (S-2) is provided in Appendix E.

Mammals

Gray myotis (Myotis grisescens), Federally-listed as endangered

Gray myotis roost almost exclusively in caves, generally utilizing different caves for summer and winter hibernaculum. Bats may migrate hundreds of kilometers between summer and winters caves. Only a very limited number of caves meet the thresholds for temperature, humidity, and isolation. Most records in Alabama are from near the Tennessee River and there are small populations in the central and southern parts of the State. Water courses and associated forested riparian corridors are important foraging areas for gray myotis.

Indiana bat (Myotis sodalis), Federally-listed as endangered

Indiana bat hibernates in caves, typically limestone with pools where the mean midwinter temperature is 4-8 degrees Celsius. In Alabama, suitable caves are utilized by bats migrating hundreds of kilometers from breeding grounds in more northern States. Indiana bat records are primarily from the northern third of the State, particularly the Bankhead National Forest and in the karst region of extreme south-central portion of the State in Jackson County.

Alabama beach mouse (Peromyscus polionotus ammobates), Federally-listed as endangered and ranked

The Alabama beach mouse is restricted to coastal dunes and scrub/shrub habitats along the Fort Morgan Peninsula in Baldwin County. Although the highest population numbers occur in primary dunes, higher secondary dunes and scrub habitats, which are less likely to be inundated, provide crucial habitat from which mice can recolonize after major storm events. All of the BLM-administered beach tracts in Baldwin County are within the designated critical habitat. On January 30, 2007, the Alabama beach mouse critical habitat was revised to include addition areas north of the coastal dunes. All of the BLM-administered highway tracts are now within areas designated as critical habitat for Alabama beach mouse. Approximately 365 acres of non-USFS FMO are within designated critical habitat.

Birds

Piping plover (Charadrius alexandrinus), Atlantic Coast and Great Plains populations listed as Federally-threatened and Great Lakes populations listed as Federally-endangered

All three populations of piping plover winter along the south Atlantic and Gulf coasts where they are classified as threatened. On July 3, 2001, USFWS designated 165,211 acres along 1,798 miles of coastline in eight southern States as critical habitat for the wintering population of piping plover. This included several barrier islands and the western tip of the Fort Morgan Peninsula. Piping plover can be present in Alabama from August to May, but numbers peak during the winter months.

Wood stork (Mycteria americana), Federally-listed as endangered

The wetlands of the Coastal Plain of Alabama provide important foraging habitat for wood storks that disperse from breeding areas in Florida, Georgia, and South Carolina in late summer and early fall. There are no recent breeding records in Alabama, although wood storks may breed in remote swamps of the State (Imhof 1976). Primarily, habitats are marshes, swamps, lagoons, ponds, and flooded fields and ditches. During extended drought, depressions in marshes and brackish wetlands have increased importance.

Red-cockaded woodpecker (Picoides borealis), Federally-listed as endangered

Red-cockaded woodpeckers are found in open, mature, old-growth pine woodlands and savannahs. Cavity trees are pines generally over 60 years old, located in open stands with little or no hardwood midstory and few or no overstory hardwoods. Hardwood encroachment resulting from fire suppression can result in cluster abandonment. Potentially suitable foraging habitat is located within 0.5 miles of nesting habitat and contains at least 50 percent pines which are 30 years or older.

Bald eagle (Haliaeetus leucocephalus), Federally-listed as threatened, proposed for delisting

Bald eagles are found throughout the State primarily along rivers and large bodies of water. Alabama supports an influx of wintering eagles. A January survey of bald eagles in Alabama has averaged about 100 – 150 birds in recent years. Concentrations occur on Pickwick Lake near Waterloo and Guntersville Lake near Guntersville State Park. A breeding population of bald eagles has been reestablished in the State. The Alabama Restoration Project hacked 91 juvenile bald eagles in the State from 1985 – 1991. In 2006, 100 nests were being monitored in the State.

Reptiles

Flattened musk turtle (Sternotherus depressus), Federally-listed as threatened

The flattened musk turtle is endemic to Alabama, and restricted to Black Warrior River watershed where it is found in medium-sized creeks to larger streams and even impoundments. Optimal stream habitat consists of a drainage at least 80.5 square kilometers (50 square miles); alternating pools and riffles, with pools at least 3-4.5 feet deep; an abundance of submerged boulders and rocks, with crevices; an abundant molluscan and benthic invertebrate fauna; a low silt load; and clean water (Mount 1981*a*). Streams with a predominant sandy substrate are also suitable as long as adequate boulder and crevice refugia are present (Ernst *et al*. 1989).

Alabama red-belly turtle (Pseudemys alabamensis), Federally-listed as endangered

The Alabama red-belly turtle is restricted to the Mobile-Tensaw River Delta in Mobile and Baldwin Counties adjacent to Mobile Bay. They are rarely found north of Interstate 65. Systematic sampling of major tributaries in coastal Alabama have shown them to be present in major rivers and tributaries of the Mobile Bay, Bayou La Batre, Fowl, Dog, Fish, Magnolia, and Bon Secour Rivers. Specimens have also been recorded from Daphne and Point Clear, Alabama. Alabama red-bellied turtles are found in shallow vegetated backwaters of freshwater streams, rivers, bays, and bayous in or adjacent to Mobile Bay.

Gopher tortoise (Gopherus polyphemus), population west of the Mobile and Tombigbee Rivers is Federally-listed as threatened

In Alabama, gopher tortoise populations usually occur below the Fall line in the Southern Pine Plains and Buhrstone/Lime Hills ecoregions. Small populations are found along alluvial sandy ridges that occur along south Alabama waterways. In Alabama, gopher tortoises are protected by Federal and State laws and found in the following counties: Choctaw, Washington, Mobile, Baldwin, Barbour, Bullock, Butler, Clarke, Crenshaw, Coffee, Conecuh, Covington, Dale, Escambia, Geneva, Henry, Houston, Monroe, Montgomery, Pike, and Wilcox. Small populations occur in Autauga and Macon counties where they were introduced by man. The largest populations occur in dry, deep sandy soils where the overhead canopy is open. The best populations in Alabama are found in longleaf pine-scrub oak-wiregrass sand hills that are frequently burned. The more loamy soils found in the longleaf-wiregrass flatwoods support small scattered populations. Clear cuts created by timber operations where gophers occur will support the tortoise for the first few years, but will be abandoned as the canopy closes, usually causing the tortoises to move to the edges of the woodland roads. Pine plantations that are managed for open canopy by thinning and burning will provide the minimum requirements to support a tortoise population. Dense hardwood and unburned pine/hardwood habitats are unsuitable for tortoise populations. Agricultural fields and wildlife food plots will support some individuals but are considered marginal habitat. Tortoises found in these habitats are usually found on the field edges and fence lines where they are not disturbed by annual plantings. Loss of habitat and historic over hunting have caused a large statewide decline of tortoise populations. There are very few public places that have tortoise populations in Alabama and only the Conecuh National Forest and Fort Rucker Military Base have more than 100 individuals. Research has shown that gopher tortoises move up to 600 feet between burrows for breeding purposes and two or more burrows within 600 feet of each other can be defined as a population (McDearman personal communication).

Eastern indigo snake (Drymarchon couperi), Federally-listed as threatened

The historical range of the eastern indigo snake was from the east coast of South Carolina through southern Georgia, Florida, into south Alabama, and southwest Mississippi, and is often associated with gopher tortoises. Particularly outside of southern Florida, gopher tortoise burrows provide important refugia from temperature extremes. Naturally occurring populations are now found only in southern Georgia and Florida. Indigo snakes were historically found in the lower coastal plain along with the burrowing gopher tortoise. In the 1980s indigo snakes were reintroduced in its historical range within the State, including releases in Autuaga, Baldwin, Bullock, Covington, Escambia, Mobile, and Washington counties. There have been subsequent sightings.

Black pine snake (Pituophis melanoleucus lodingi), Candidate for Federal listing

Black pine snakes are endemic to the upland longleaf pine forests that once covered the southeastern United States. Habitat consists of sandy, well-drained soils with an overstory of longleaf pine, a fire suppressed mid-story, and dense herbaceous ground cover. In Alabama, there are recorded sightings in Mobile County.

Loggerhead sea turtle (Caretta caretta), Federally-listed as threatened

The most common nesting sea turtle in Alabama, loggerheads nest on open sandy beaches above the high-tide mark, seaward of well-developed dunes from the Florida border to Dauphin Island, with the majority nesting between Fort Morgan and Gulf Shores. Nesting normally occurs from early May through August, with the majority of nests being laid during June and July. Females lay three to five nests, and sometimes more, during a single nesting season. The eggs incubate approximately two months before hatching sometime between late June and mid-November.

Green sea turtle (Chelonia mydas), Federally-listed as threatened

Green sea turtles are rarely seen in Alabama. There have been two recent nesting records in the State. Small numbers of this herbivorous species, most often subadults, occur in State waters, but feeding areas of submerged grass beds are limited in Alabama.

Kemp’s Ridley sea turtle (Lepidochelys kempii), Federally-listed as endangered

Kemp’s Ridley sea turtle is an occasional visitor to Alabama waters, where it is sometimes caught in shrimp nets. Although virtually the entire population nests in Mexico and southern Texas, at least two nests have been documented in Alabama.

Leatherback sea turtle (Dermochelys coriacea), Federally-listed as endangered

Leatherback sea turtle is an occasional visitor to Alabama waters, but not known to nest in the State.

Amphibians

Mississippi gopher frog (Rana sevosa), Federally-listed as endangered

This species is currently known from a single population in Mississippi, but it has also been recorded from Gulf Coast Flatwoods of Alabama (at the mouth of Dog River). It is highly terrestrial. Breeding occurs late January to March in open temporary ponds. Habitat includes both upland sandy habitats historically forested with longleaf pine and isolated temporary wetland breeding sites imbedded within this forested landscape.

Flatwoods salamander (Ambystoma cingulatum), Federally-listed as threatened

Flatwoods salamander’s historic distribution in Alabama was confined to southernmost tier of counties (Mobile, Baldwin, Escambia, Covington, Geneva, and Houston). The most recent records are from

Covington and Houston Counties, 1980 and 1981, respectively. The species has not been recorded in over two decades, despite surveys from 1992 to 1995. Characteristic habitat is pine flatwoods, where larvae utilize shallow pondcypress or blackgum ponds, marshy pasture ponds, roadside ditches, or small, shallow borrow pits.

Red Hills salamander (Phaeognathus hubrichti), Federally-listed as threatened

This salamander is irregularly distributed within a narrow belt of two geological formations (Tallahatta and Hatchetigbee) in parts of five counties (Crenshaw, Butler, Covington, Conecuh, and Monroe) in the Red Hills (Schwaner and Mount 1970, Mount 1975). Characteristic habitat is on steep slopes (especially north-facing) of ravines and bluffs dominated by hardwood trees such as magnolias, American beech, tuliptree, oaks, and hickories. Older-growth timber is preferred. Complete removal of forest canopy in most cases results in extirpation of a resident population.

Black Warrior waterdog (Necturus alabamensis), a candidate for Federal listing

The Black Warrior waterdog inhabits streams above the Fall Line within the Black Warrior River Basin in Alabama. Currently, the species is known from 14 sites in 5 counties: Blount, Marshall, Tuscaloosa, Walker, and Winston. Within these counties, occupied river systems including the North River, Locust Fork, and Mulberry Fork are all on the EPA’s list of impaired waters. Black Warrior waterdogs are associated with clay substrates lacking silt. Stream depths range from 3.3 to 13.1 feet and contain large leaf packs supporting mayfly and caddis fly larvae.

Fish

Gulf sturgeon (Acipenser oxyrinchus dosotoi), Federally-listed as threatened

Adult Gulf sturgeons migrate into large river systems between late March and early April to spawn, sometimes moving as much as 140 miles upstream. Adults and subadults return to the Gulf of Mexico in late fall. The young generally stay in the river mouth through winter and spring. Critical habitat has been designated in Alabama and includes reaches of the Escambia/Conecuh River system in Escambia, Conecuh and Covington Counties, and the Choctawhatchee River in Geneva County.

Alabama sturgeon (Scaphirhynchus suttkusi), Federally-listed as endangered

The Alabama sturgeon is now restricted to a 130-mile reach of the Alabama River below Miller’s Ferry Lock and Dam. The Alabama sturgeon currently inhabits only about 15 percent of its historic range which originally included about 1,000 miles of the Mobile River system in Alabama (Black Warrior, Tombigbee, Alabama, Coosa, Tallapoosa, Mobile, Tensaw, and Cahaba Rivers) and Mississippi (Tombigbee River).

Blue shiner (Cyprinella caerulea), Federally-listed as threatened

In Alabama, the blue shiner occurs in Weogufka Creek in Coosa County; Choccolocco Creek, and the lower reach of Shoal Creek in Calhoun County; and Little River in Cherokee County. The blue shiner prefers a sand or sand and gravel substrate sometimes with cobble, low to moderate velocity current, and a depth of about 0.15 to 1 meters.

Palezone shiner (Notropis albizonatus), Federally-listed as endangered

Palezone shiner habitat is described as upland large creeks and small rivers with permanent flow, in runs and flowing upper portions of pools over clean substrates of bedrock, cobble, and gravel mixed with clean sand. The currently documented range includes two widely disjunct populations, one of which is a 25-km reach of the Paint Rock River in Jackson County, Alabama. The other population is found in portions of the Cumberland and Tennessee River systems in Kentucky and Tennessee.

Cahaba shiner (Notropis cahabae), Federally-listed as endangered

The stronghold for the species is limited to about 15 river miles between the Fall Line and Piper Bridge in Bibb County, Alabama. The species occurs in large shoal areas of the main channel of the Cahaba River, particularly in the quieter water less than 1.64 feet deep just below swift riffle areas. The species prefers patches of sandy substrate at the edge of or scattered throughout gravel beds or downstream of larger rocks and boulders. This shiner probably requires a river with sufficient small crustaceans, insect larvae, and algae for food, similar to its close relative, the mimic shiner.

Alabama cavefish (Speoplatyrhinus poulsoni), Federally-listed as endangered

The Alabama cavefish is known only from the type locality, Key Cave in Lauderdale County, Alabama.

Pygmy sculpin (Cottus paulus), Federally-listed as threatened

The pygmy sculpin is an Alabama endemic known from Coldwater Spring and its adjacent downstream spring run, a tributary to Choccolocco Creek in Calhoun County.

Slackwater darter (Etheostoma boschungi), Federally-listed as threatened

The slackwater darter is know from disjunct populations in the Cypress Creek, Swan Creek, upper Shoal Creek, and Flint River systems in north Alabama and south-central Tennessee, and from the headwaters of the Buffalo River in Tennessee.

Vermillion darter (Etheostoma chermocki), Federally-listed as endangered

The vermillion darter is limited in distribution to upper Turkey Creek, a tributary to the Locust Fork of the Black Warrior River system in Jefferson County, Alabama. The vermilion darter occurs in moderate-to-swift currents in streams of alternating riffles and pools.

Watercress darter (Etheostoma nuchale), Federally-listed as endangered

The watercress darter is only known to occur in three springs in Jefferson County. A new population has been successfully established by transplanting individuals from Roebuck Springs to Tapawingo Springs, a tributary of Turkey Creek.

Boulder darter (Etheostoma wapiti), Federally-listed as endangered

Boulder darters currently occur in the Elk River system in Giles and Lincoln Counties, Tennessee, and Limestone County, Alabama. In 1993, in an effort to reestablish the species within its historic range, boulder darters were released at three locations in the Elk River, all upstream of Alabama Highway 127 in Limestone County.

Rush darter (Etheostoma phytophilum), a candidate for Federal listing

The rush darter is endemic to upland portions of the Black Warrior River system in Alabama where it occurs in shallow headwater streams. This species is uncommon and sporadic within its range, as it favors shallow, flowing water in spring runs and spring-associated streams with emergent vegetation. Only three disjunct populations are known: one in the Clear Creek system in Winston County, one in spring-fed tributaries of Turkey Creek in Jefferson County; and one population in Little Cove Creek in Etowah County.

Goldline darter (Percina aurolineata), Federally-listed as threatened

The goldline darter continues to exist in fragmented populations in the Coosawattee River, Georgia, in about 7 miles of the Little Cahaba River, and in 27 miles of the 49 miles of historic range in the Cahaba River, Alabama. This species prefers moderate to swift currents and water depths greater than two feet. It is found over sand or gravel substrata interspersed among cobble and small boulders.

Snail darter (Percina tanasi), Federally-listed as threatened

The snail darter is presently known from only six Tennessee River tributaries and from the main stem of the Tennessee River near the mouth of three tributaries. In Alabama, the snail darter is restricted to the Paint Rock River in Jackson and Madison Counties. This species prefers two types of habitat: relatively shallow gravel shoal areas with moderate to swift current; and deep slackwater pools in large streams and rivers.

Mussels

The following mussel species in Alabama are Federally-listed as endangered, threatened, or are candidates for Federal listing. Most of these species require flowing water, over clean, stable sand and gravel. Pollution, construction of dams and impounding of major rivers, such as the Tennessee, Coosa, Black Warrior and Alabama, and dredging and channelization have resulted in the declines and extirpation of many mussel species in Alabama. The occurrence records below were based on historic and current records from Nature Serve (2006).

Table 3-2. Federally-listed Mussel Species in Alabama

Federally-listed Mussel Species in Alabama	Federal Status*	County Occurrence Records
Acornshell, southern (*Epioblasma othcaloogensis*) **probably extirpated**	E*	Bibb, Cherokee, Etowah, St. Clair, and Shelby
Bean, Choctaw (*Villosa choctawensis*)	C	Barbour, Bullock, Coffee, Covington, Dale, Geneva, Henry, Houston and Pike Counties.
Blossom, turgid (pearlymussel) *(Epioblasma turgidula)* **probably extinct**	E	Colbert, Franklin, and Lauderdale Counties
Blossom, yellow (pearlymussel) (*Epioblasma florentina* florentina) **probably extirpated**	E	Lauderdale and Colbert Counties
Catspaw (Epioblasma *obliquata obliquata*) **probably extirpated**	E	NA (Muscle Shoals)
Clubshell, black (=Curtus' mussel) *(Pleurobema curtum)* **probably extirpated**	E	NA (Tombigbee River)
Clubshell, ovate (*Pleurobema perovatum*)	E*	Blount, Greene, Fayette, Lee, Lamar, Lee, Etowah, Macon, Pickens, St. Clair, Sumter, Tuscaloosa, Walker, and Winston Counties

Federally-listed Mussel Species in Alabama	Federal Status*	County Occurrence Records
Clubshell, southern (*Pleurobema decisum*)	E*	Cherokee, Dallas, Etowah, Fayette, Greene, Lamar, Pickens, St. Clair, and Tuscaloosa Counties
Combshell, Cumberlandian (*Epioblasma brevidens)*	E*	Colbert and Etowah Counties
Combshell, southern (=penitent mussel) *(Epioblasma penita)*	E	Etowah, Lamar, and Marion Counties
Combshell, upland (*Epioblasma metastriata*) **probably extirpated**	E*	Bibb, Shelby, and Jefferson Counties
Fanshell (*Cyprogenia stegaria*)	E	Colbert, Lauderdale and Marshall Counties
Heelsplitter, Alabama (=inflated) *(Potamilus inflatus)*	T	Baldwin, Bibb, Choctaw, Clarke, Greene, Hale, Marengo, Pickens, Sumter, Tuscaloosa, and Washington Counties
Kidneyshell, triangular (*Ptychobranchus greenii*)	E*	Blount, Cherokee, Cullman, Etowah, Jefferson, Lawrence, St. Clair, Walker, and Winston Counties
Kidneyshell, Southern (*Ptychobranchus jonesi*)	C	Barbour and Coffee Counties
Lampmussel, Alabama (*Lampsilis virescens*)	E	Jackson County
Lilliput, pale (pearlymussel) *(Toxolasma cylindrellus)*	E	Jackson County
Moccasinshell, Alabama (*Medionidus acutissimus*)	T*	Cherokee, Etowah, Greene, Lamar, Lawrence, Pickens, St. Clair, Shelby, and Winston Counties
Moccasinshell, Coosa (*Medionidus parvulus*)	E*	Cherokee, Talladega, and Winston Counties
Moccasinshell, Gulf (*Medionidus penicillatus*) **Probably extirpated**	E	NA (Chattahoochee River drainage)
Monkeyface, Cumberland (pearlymussel) (*Quadrula intermedia*)	E	Limestone County
Mucket, orange-nacre (*Hamiota (Lampsilis) perovalis*)	T*	Bibb, Fayette, Greene, Jefferson, Lamar, Lawrence, Pickens, Shelby, Tuscaloosa, and Winston Counties
Mucket, pink (pearlymussel) (*Lampsilis abrupta*)	E	Colbert, Jackson, Madison, Morgan, Marshall, Lauderdale, Lawrence, and Limestone Counties
Oyster mussel, (*Epioblasma capsaeformis*)	E*	NA (Tennessee and Cumberland river drainages)
Pearlshell, Alabama (*Margaritifera marrianae*)	C	Conecuh and Crenshaw Counties
Pearlymussel, cracking (*Hemistena lata*)	E	Colbert and Lauderdale Counties
Pearlymussel, dromedary (*Dromus dromas*) **probably extirpated, possible reintroduction**	E	Colbert and Lauderdale Counties
Pearlymussel, littlewing (*Pegias fabula*) **probably extirpated**	E	Lauderdale County
Pearlymussel, slabside (*Lexingtonia dolabelloides*)	C	Colbert, Jackson, Madison, and Marshall Counties

Federally-listed Mussel Species in Alabama	Federal Status*	County Occurrence Records
Pigtoe, dark (*Pleurobema furvum*)	E*	Fayette, Lawrence, Tuscaloosa, Winston, and Jefferson Counties
Pigtoe, fine-rayed (*Fusconaia cuneolus*)	E	Jackson, Marshall, and Madison Counties
Pigtoe, flat (=Marshall's mussel) (*Pleurobema marshalli*) **probably extirpated**	E	Greene and Sumter Counties
Pigtoe, fuzzy (*Pleurobema strodeanum*)	C	Barbour, Bullock, Coffee, Conecuh, Dale, Escambia, Geneva, Henry, and Pike Counties
Pigtoe, oval (Pleurobema pyriforme)	E	Houston County
Pigtoe, heavy (=Judge Tait's mussel) (*Pleurobema taitianum*)	E	Baldwin, Clarke, Dallas, Greene, Monroe, Sumter, Pickens, and Wilcox Counties
Pigtoe, rough (*Pleurobema plenum*)	E	Colbert, Lauderdale, Madison, Morgan, Marshall, Lawrence, and Limestone Counties
Pigtoe, shiny (Fusconaia cor (=edgariana))	E	Jackson, Marshall, and Madison Counties
Pigtoe, southern (Pleurobema georgianum)	E*	Cleburne County
Pimpleback, orangefoot (pearlymussel) (*Plethobasus cooperianus*)	E	Madison and Marshall Counties
Pink, ring (mussel) (*Obovaria retusa*)	E	Colbert and Lauderdale Counties
Pocketbook, finelined (*Hamiota (=Lampsilis) altilis*)	T*	Blount, Calhoun, Cherokee, Elmore, Etowah, Macon, Shelby, St. Clair, Talladega, Lawrence, Walker, Winston, Dekalb, Lee, Dallas, Clay, Bibb, Jefferson, Tuscaloosa, Fayette, Tallapoosa, and Cullman Counties
Pocketbook, shinyrayed (*Hamiota* (*Lampsilis) subangulata*)	E	Russell County
Purple bankclimber (*Plectomerus (=Elliptoideus) sloatianus*)	T	NA (Chattahoochee River)
Sandshell, southern (*Lampsilis australis*)	C	Barbour, Coffee, Covington, Dale, Geneva, Henry and Pike Counties
Stirrupshell (*Quadrula stapes*) **probably extinct**	E	Pickens County
Wartyback, white (pearlymussel) (*Plethobasus cicatricosus*)	E	Colbert and Lauderdale Counties

Note: E=Endangered, C=Candidate, and T=Threatened
*Denotes species with designated critical habitat in Alabama

Aquatic Snails

The following Federally-listed snails utilize many of the same riverine habitats discussed above under Mussels and have been affected by many of the same land use practices including impoundments and the general deterioration of water quality from siltation and other pollutants contributed by past mining activities, poor land-use practices, and waste discharges. Seven of these aquatic snails are endemic to the Mobile River Basin, where they inhabit shoals, rapids, and riffles of large streams and rivers above the Fall Line. All have disappeared from more than 90 percent of their historic ranges.

Table 3-3. Federally-listed Aquatic Snail Species in Alabama

Federally-listed Aquatic Snail Species in Alabama	Federal Status	County Occurrence Records
Armored snail (*Pyrgulopsis pachyta*), Federally-listed as endangered	E	Limestone County
Cylindrical lioplax (*Lioplax cyclostomaformis*), Federally-listed as endangered	E	Bibb and Shelby Counties
Flat pebblesnail (*Lepyrium showalteri*)	E	Bibb and Shelby Counties
Lacy elimia (Elimia renetella)	T	Talladega County
Painted rocksnail (*Leptoxis taeniata*)	T	Calhoun, Chilton, Shelby, and Talladega Counties
Plicate rocksnail (*Leptoxis plicata*)	E	Blount and Jefferson Counties.
Round rocksnail (*Leptoxis ampla*), Federally-listed as threatened	T	Bibb and Shelby Counties
Slender campeloma (*Campeloma decampi*)	E	Limestone County
Tulotoma snail (*Tulotoma magnifica*), Federally-listed as endangered	E	Calhoun, Coosa, Elmore, Shelby, St. Clair, and Talladega Counties

Note: E=Endangered, C=Candidate, and T=Threatened

Crayfish

Although there are no Federally-listed crayfish in Alabama, the state is home to 83 species of crayfish, more species than any other state. Twenty are listed as critically imperiled (S-1) or imperiled (S-2) by ANHP.

Cave Shrimp

Alabama Cave Shrimp (Palaemonia alabamae), Federally-listed as endangered

This freshwater shrimp is known from only two caves in Madison County.

Insects

Mitchell’s satyr butterfly (Neonympha mitchellii mitchellii), Federally-listed as endangered

There are recent isolated records of this butterfly in calcareous wetlands dominated by sedges and eastern redcedar.

Plants

Alabama canebrake pitcher plant (Sarracenia rubra ssp. alabamensi), Federally-listed as endangered

This pitcher plant is found in sand hills, swamps, and sloping bogs along the Fall Line Hills in saturated, deep peaty sands or clay soils. This species is now restricted to three counties: Autauga, Chilton, and Elmore in Alabama. One of the largest populations is located in the Roberta Case Pine Hills Preserve in Autauga County managed by The Nature Conservancy.

Price's potato bean (Apios priceana), Federally-listed as threatened

Price's potato bean is an herbaceous twining perennial vine typically located under mixed hardwoods or in associated forest clearings, often where bluffs or ravine slopes meet creek or river bottoms. Soils are generally well-drained and loamy, formed on alluvium or over calcareous boulders. Several populations extend onto road or powerline rights-of-way (ROW). Three extant populations are known from Alabama in Madison, Autsuga, and Marshall Counties. Two of the populations are located along the floodplain of the Alabama River.

American chaffseed (Schwalbea americana), Federally-listed as endangered

American chaffseed is a perennial member of the figwort family found in acidic, sandy or peaty soils in open pine flatwoods, pitch pine lowland forests, seepage bogs, palustrine pine savannahs, and other grass- and sedge-dominated plant communities. It frequently grows in ecotonal areas between peaty wetlands and xeric sandy soils. In these situations, individuals sometimes extend well into the drier communities, but seldom into the areas that support species characteristic of wetter soils. Surrounding plant communities are typically species-rich. There are historic records in Baldwin and Geneva Counties in Alabama.

Panhandle lily (Lillium iridollae), a candidate for Federal listing

In the Gulf Coastal Plain of Florida and Alabama, this species inhabits baygalls, wet flatwoods, seepage slopes, and the edges of bottomland forests. It is typically found in sandy peat or loamy soils which are saturated for at least part of the year and include soils classified as Bibb-Kinston-Johns complex, Dorovan-Pamlico complex, Lynchburg fine sandy loam, and Rutledge loamy sand. The sites are open to full sun or filtered light. This species often occurs in the ecotone between the more open pine/wiregrass uplands, or along the stream corridor itself. In Alabama there are records from Baldwin, Covington, and Escambia Counties.

Mohr's Barbara buttons (Marshallia mohrii), Federally-listed as threatened

This aster is found in moist to wet prairie-like openings in pine woodlands, along shale-bedded streams, and in meadows. Other populations are located in swales on roadside ROW and in Ketona dolomite glades. It prefers full sunlight or partial shade. The soils are sandy clays, which are alkaline, high in organic matter and seasonally wet. Common associates include various grasses, sedges, and prairie species. In Alabama, there are records in Bibb, Calhoun, Cherokee, and Walker Counties.

Tennessee yellow-eyed grass (Xyris tennesseensis), Federally-listed as endangered

Although *Xyris* species are usually found on acidic soils, *X. tennesseensis* is restricted to basic or neutral soils that thinly cover calcareous substrates with year-round seepage or mineral-rich water flow. This species is found in open or thin canopy woods in gravelly seep-slopes or gravelly bars and banks of small streams, springs, and ditches. In Alabama there are records from Bibb, Calhoun, Franklin, and Shelby Counties.

Georgia rockcress (Arabis georgiana), a candidate for Federal listing

Typically found in shallow soil accumulations on rocky bluffs, ecotones of gently sloping rock outcrops, outcrops along rivers, and sandy loam along eroding riverbanks. It is occasionally found in adjacent mesic woods, but it will not persist in heavily shaded conditions. In Alabama, there are records from Bibb, Elmore, and Wilcox Counties.

Georgia aster (Symphyotrichum georgiana), a candidate for Federal listing

This aster prefers dry open woods, roadsides, and other openings. In Alabama, there are records in Bibb, Blount, Etowah, Shelby, St. Clair, and Tuscaloosa Counties.

White fringeless orchid (Platanthera integrilabia), a candidate for Federal listing

White fringeless orchid is generally found in wet, flat, boggy areas at the head of streams or seepage slopes. The species is often found in acidic muck or sand, and in partially, but not fully shaded areas. In Alabama, there are records in Calhoun, Cleburne, Jackson, Marion, Tuscaloosa, and Winston Counties.

Alabama leather flower (Clematis socialis), Federally-listed as endangered

The Alabama leather flower is an erect, non-viney perennial herb known from only five sites in northeast Alabama and one in northwest Georgia. One population is protected on The Nature Conservancy’s Dry Creek Preserve in St. Clair County. Locations are described as having silt and clay of alluvial, grass-sedge openings extending into the adjacent hardwood edge.

Kral’s water plantain (Sagittaria secundifolia), Federally-listed as threatened

Kral’s water plantain typically occurs on frequently exposed shoals or rooted among loose boulders in quiet pools up to 3.2 feet or 1 meter in depth. In Alabama, this aquatic perennial is known to occur in only 12 sites scattered along 25 miles of the Little River drainage system in Dekalb and Cherokee Counties.

Whorled sunflower (Helianthus verticullatus), a candidate for Federal listing

The whorled sunflower is restricted to remnant prairie habitat. In Alabama, there are records in Cherokee County.

Leafy prairie-clover (Dalea foliosa), Federally-listed as endangered

Leafy prairie-clover is a perennial herb found in open, thin-soiled limestone glades and limestone barrens. In Alabama there are records in Colbert, Franklin, Lawrence, and Morgan Counties.

Louisiana quillwort (Isoetes louisianensis), Federally-listed as threatened

Louisiana quillwort appears to be restricted to shallow blackwater streams in riparian woodland and bayhead forest areas of pine flatwoods. The plants are found on stable sand and gravel bars, moist overflow channels with silty sand substrates, and on low, sloping banks near and below water level. In Alabama, there are records from Conecuh and Monroe Counties.

Pondberry (Lindera melissifolia), Federally-listed as endangered

Pondberry habitat is characterized as seasonally flooded wetlands, such as floodplain hardwood forests and forested swales, usually in shade, but tolerates full sun. In Alabama, there are 2004 records in Covington County.

Harperella (Ptillimnium nodosum), Federally-listed as endangered

Harperella is an annual that typically occurs in two habitat types: rocky or gravelly shoals of clear, swift-flowing streams, usually in microsites that are sheltered from rapidly moving water; and the edges of intermittent pineland ponds or low, wet savannah meadows on the Coastal Plain. In Alabama, there are records from Cherokee and Dekalb Counties. On non-USFS FMO, there are 642 acres of potential habitat within 200 meters of known occurrences.

Lyrate bladder-pod (Lesquerella lyrata), Federally-listed as threatened

Lyrate bladder-pod is found in red soils, limestone outcroppings, disturbed cedar glades and glade-like areas, including open pastures, cultivated fields, and roadsides in calcareous areas. In Alabama, there are records in Colbert, Franklin, and, Lawrence Counties.

Gentian pinkroot (Spigelia gentianoides var. entianoides), Federally-listed as endangered

Gentian pinkroot is a herbaceous perennial found in sandy or dry-mesic pine-oak woods or in longleaf pine-oak woods with a sparse herbaceous element, including wiregrass (*Aristida stricta*). It is known only from Bibb County.

Relict trillium (Trillium reliquum), Federally-listed as endangered

Relict trillium is a species of mesic hardwood forests. The forests can be on slopes of various aspects and inclinations or on bottomlands and floodplains. Soils and subsoils range from rocky clays to alluvial sands; all soils have high organic matter content in the top level. In Alabama, there are records from Bullock, Henry, and Lee Counties.

Morefield's leather-flower (Clematis morefieldii), Federally-listed as endangered

Morefield's leather flower is a perennial vine found in basic clay-loam soils in rocky limestone woods on the south and southwest facing slopes of mountains. It is currently known from only five locations in Madison County.

American hart's-tongue fern (Phyllitis scolopendrium var. americana), Federally-listed as threatened

This species is typically found in areas with shady, moist areas and in dolomitic limestone. The two populations known in Alabama are associated with caves. One population occurs in a Jackson County sinkhole on lands managed as a NWR. The other population is in Morgan County, in the privately owned pit entrance to a limestone cave.

Fleshyfruit gladecress (Leavenworthia crassa), candidate for Federal listing

The fleshyfruit gladcress occurs in limestone cedar glades, as well as disturbed roadsides, pastures, cultivated fields, and old fields. In Alabama, there are records from Lauderdale, Lawrence, and Morgan Counties.

Green pitcher plant (Sarracenia oreophila), candidate for Federal listing

Green pitcher plants are found in seepage bogs, sandstone streambanks, and mixed oak or pine flatwoods, where soils are sandy and highly acidic. In Alabama, records are from the northeastern counties of Jackson, Marshall, Dekalb, Cherokee, and Etowah Counties. There are confirmed records of green pitcher plant on 635 acres of non-USFS FMO in Cherokee, DeKalb, and Etowah Counties and an additional 646 acres of non-USFS FMO within 200 meters of known occurrences.

3.2.7 Wildland Fire Ecology and Management

There are two wildfire seasons each year in southeastern States. The first wildfire season usually begins in late October with the first frost and hardwood leaf drop and runs through December. The second wildfire season usually begins in February and runs to mid-April or until spring green-up. These seasons vary from year to year, depending on rainfall, wind, and other weather factors. Wildfires in the South are normally not as large as those that occur in the West because of aggressive initial fire control. However, wildfires in the South cause extensive damage and can be an avenue for decay in individual trees, weakening them and making them susceptible to insect disease and infestation (Southern Group of State Foresters 2004).

Alabama’s forests and associated species are adapted to regular wildland fire. However, changing land use practices, urban sprawl, land fragmentation, natural disasters such as hurricanes, increasing land values, population increases, and the transition from urban to rural populations results in a build up of fuels and a need to increase fuels management and wildland fire activities (Southern Group of State Foresters 2004). Through the course of an average year in Alabama, there are 4,000 individual wildland fires that burn 40,000 acres (Southern Group of State Foresters 2004). The average wildfire size is approximately 12 acres per fire (AFC 2004). Escaped fires from debris burning and arson are major causes of wildland fire, though lightening accounts for approximately 7 percent of wildfires (Southern Group of State Foresters 2004). “Each year Alabama wildfires damage or destroy 46 homes, 114 structures, and 1,100 vehicles” (Southern Group of State Foresters 2004). A rapidly expanding population has led to large and expanding areas of wildland-urban interface (WUI) across the State, with an estimated 1,350 WUI communities with potential wildland fire damage risk (Southern Group of State Foresters 2004).

The Alabama Forestry Commission (AFC) is responsible for suppression of all wildland fires in the State, except on lands under Federal ownership (Southern Group of State Foresters 2004). This includes suppression of wildland fires on nearly 28 million of the 32 million acres in Alabama and 23 million acres of forestland. These suppression activities apply to State and private forested acres plus other vegetated areas, such as farms and pastures. On Federally managed lands (5% of the forestland base), the AFC has mutual aid agreements to support Federal wildland fire suppression efforts.

Since forestlands and species in Alabama are adapted to regular disturbance by wildland fires to maintain forest health, but suppression activities limit the role of natural wildland fires, managed fuel treatments are needed to maintain forest health. Table 3-4 shows the fuels treatments completed in Alabama by Department of the Interior agencies and USFS. The BLM did not conduct any fuels treatments in Alabama over these four years. Over 98 percent of these treatments were completed by the USFS using prescribed fires approximately 90 percent of the time. Over 97 percent of Federal fuels treatments were applied in WUI areas.

Table 3-4. DOI and USDA Fuels Treatment Accomplishments for Alabama (Acres)

Year	Wildland-Urban Interface			Other			Total
	Fire	Mechanical	Total	Fire	Mechanical	Total	
2006	69,112	3,602	72,714	3,529	5,190	8,719	81,433
2005	84,804	12,313	97,117	157	282	439	97,556
2004	82,391	6,336	88,727	0	0	0	88,727
2003	76,884	16	76,900	0	0	0	76,900

Source: http://www.fireplan.gov/overview/States/al.html, accessed March 2, 2007

Fuels treatments, including prescribed fire, are also implemented by the AFC on the private and State-owned forests. In addition, the AFC provides training and permitting to ensure that fuels treatments in these areas, and prescribed fire in particular, are completed in a manner that protects firefighter and public safety, as well as capital improvements and natural resources.

3.2.8 Cultural Resources

The Alabama surface and non-USFS FMO tracts have not been fully surveyed for cultural resources. Surveys that have been conducted are usually initiated by project proponents on a project-specific basis, such as for oil and gas, coal mining, transportation, or water projects, to comply with the requirements of Section 106 of the National Historic Preservation Act (NHPA), outlined in 36 Code of Federal Regulations (CFR) Part 800. Section 106 requires Federal agencies to identify prehistoric and historic properties potentially affected by an undertaking; assess the effects of the undertaking; consult with appropriate entities; and seek ways to avoid, minimize, or mitigate any adverse effects to the property.

A cultural resources literature and records search was conducted for BLM surface and non-USFS FMO tracts in the State of Alabama. The results of the research are presented in an overview (Panamerican Consultants, Inc. 2005a) on file at the BLM office in Jackson. The following cultural resource information was taken from Panamerican Consultants, Inc. (2005a), unless otherwise noted.

Prehistory

A variety of cultural resource site types attributed to a range of culturally distinct chronological periods ranging from more than 10,000 years ago to the present day has been recorded in the southeastern United States. The cultural time periods represented include Paleoindian, Archaic, Gulf Formational, Woodland, Mississippian, and Protohistoric. Descriptions of the prehistoric periods and general types of cultural materials associated with each one are provided in Table 3-5 below. Cultural resources from any of these time periods may be present on BLM-administered surface and non-USFS FMO tracts.

Table 3-5. Prehistoric Periods Present in Southeastern United States

Cultural Time Period	Time Frame (Years Before Present [B.P.])	Characteristics
PALEOINDIAN	12,500 – 10,000	Specialized nomadic hunters of now-extinct megafauna.
Early Paleoindian	12,500 – 10,900	Fluted lanceolate points resembling western Clovis forms.

Cultural Time Period	Time Frame (Years Before Present [B.P.])	Characteristics
Middle Paleoindian	10,900 – 10,500	Fluted and unfluted points with broad blades and constricted hafts, such as Cumberland, Suwannee, Simpson, Quad, and Beaver Lake.
Late Paleoindian	10,500 – 10,000	Resharpened lanceolate corner- and side-notched forms, such as Dalton, San Patrice, and Bolen.
ARCHAIC	10,000 – 3,000	Marked by a shift in lifeways indicated by development of a more complex material culture, nomadism giving way to more sedentism, localized habitat exploitation, and dramatic population increase. Many tool forms appeared for the first time during this stage.
Early Archaic	10,000 – 8,000	A directional shift from highly curated tool forms associated with Paleoindian sites to highly expedient forms linked to Early Archaic corner-notched assemblages. An increase in residential mobility, as indicated by greater numbers of expedient tools in Early Archaic assemblages.
Middle Archaic	8,000 – 5,000	Demarcated by the appearance of stemmed bifaces.
Late Archaic	5,000 – 3,050	Increased sedentism and a practice of a dichotomous pattern of resource exploitation that shifted between riverine and uplands locations.
GULF FORMATIONAL	4,000 – 1,850	Primarily recognized as an intermediate stage of social and economic change. The rise and development of baked clay ceramic technology during which Archaic peoples learned the manufacture of stone and ceramic vessels.
Middle Gulf Formational	3,200 – 2,500	Characterized by fiber-tempered plain and punctate wares.
Late Gulf Formational	2,500 – 2,100	Represented by disappearance of fiber-tempered ceramics and the rise of more decorative ceramic series.
WOODLAND	2,600 – 850	Marked by the advent of cord-marked, fabric-impressed, and stamped pottery, construction of burial mounds, and increased reliance on domesticated cultigens. The bow and arrow was introduced.
Early Woodland	2,950 – 2,050	Three phases including the Kellog phase (sand-tempering fabric-impressed pottery types), Dry Branch phase (sand-tempered incised, punctated, and pinch pottery types), and Cedar Bluff phase (limestone-tempered fabric-impressed pottery).
Middle Woodland	2,150 – 1,550	Diversity in style and manufacture of pottery increased markedly. There was also an increase in burial mound construction, shared artifacts, and iconography, suggesting that a wide trade interaction continued across the United States.

Cultural Time Period	Time Frame (Years Before Present [B.P.])	Characteristics
Late Woodland	1,550 – 950	A period of cultural decline related to turmoil across much of the East; however, this was not the case in every region of the Southeast. Some diffusion of exotic and decorative motifs on pottery, and mound construction continued to play a crucial role in some regions of the eastern United States. Population growth exploded early in this period; consequently, small communities and households were widely scattered across the landscape. The increase in population stress, particularly over food resources, and increased use of the bow and arrow heightened warfare.
MISSISSIPPIAN	1,050 – 450	Complex sociopolitical organizations (chiefdoms) marked by the development of institutional inequality. Large fortified settlements and civic-ceremonial centers distinguished by elaborate temple mounds were widespread phenomena during the Mississippian period.
Early Mississippian	1,050 – 750	A very complex society and diversity varied greatly throughout the Southeast.
Mature Mississippian	750 – 450	A very complex society and diversity varied greatly throughout the Southeast.
PROTOHISTORIC	400 – 235	Defined in the southeastern United States as the era of transition from occupation of the region by preliterate societies to occupation by literate societies. Widespread destruction of Indian villages and fields and introduction of previously absent Euro-Asian diseases caused massive demographic upheaval. Trade and political networks were altered or broken down, and whole populations relocated or were devastated by illness.

Source: Panamerican Consultants, Inc. 2005a, 2005b.

History

A wealth of Alabama history is associated with American Indian inhabitants, European exploration, multiple battles, and the evolution of southern culture. The events discussed below provide the context and relative importance of the cultural site types that may be encountered on BLM-administered surface and non-USFS FMO tracts.

From the 16th to the 19th century, Spain, France, and England fought for domination and possession of the territories and resources in the southeastern United States. Led by Hernando De Soto, Spanish explorers in search of gold were the first Europeans to reach this territory in 1539. During the Pontotoc Battle of 1541, many members of De Soto’s expedition were killed in an attack by the Chickasaw Indians. An initial settlement in the Mobile Bay area by Spanish colonists from Mexico was abandoned in 1559, and Spain made no further effort to settle the area. The French were the first to successfully colonize Alabama. Early settlements were fortified trading posts along major rivers. French influence waned as the American Indians began to favor British traders from the Carolinas and Georgia. Great Britain and France fought a series of wars, climaxing with the French and Indian War (1754 – 1763). By the terms of the treaty ending the war, France ceded its North American lands to England. Britain created Reservation Lands for the American Indians in portions of the southeastern States.

American Indians had low immunity to new diseases brought by Europeans. By the 18th century, their numbers had been reduced and many tribes approached extinction (Dobyns 1983; Milner 1980; Ramenofsky 1987). Most of the survivors in present-day Alabama were members of four major Indian nations—the Creek, the Cherokee, the Chickasaw, and the Choctaw. The Cherokee Indians inhabited the northeastern corner, and the Chickasaw Indians claimed the northwestern corner of the State. The Choctaw Indians lived in the west-central portion, and the Creek Indians occupied the east-central and southern portions of the State.

In the language of the local Creek Indians, the word Alabama means “tribal town.” The American Revolution (1775 – 1783) had a profound effect on Alabama and American Indians, as did the Louisiana Purchase, the War of 1812, and Creek War. Until 1817, Alabama was a part of the Mississippi Territory, but in 1819, it became the 22nd State to enter the Union. From 1829 – 1837, the remaining Indian nations were forced to give up their lands and were moved west of the Mississippi. From the early 19th century, Alabama’s economy was dominated by cotton. The highly productive regions of the State, namely the Black Belt region and the Tennessee Valley, soon brought a shift from independent, small farms to large plantations. Slavery was vital to the growth and production of cotton and became a contentious issue in Alabama and the other States. The pro-slavery States began to move toward secession from the Union, and in 1861, Alabama also voted to secede (Butterworth 1959). The people of Alabama played a major role in the Civil War; multiple battles were fought on State soil; and Montgomery was the first capital of the Confederacy, which was later moved to Virginia. In 1865, the Civil War ended and slaves were emancipated. Sharecropping and tenant farming became the common mode of farming.

In the late 1870s, railroads were built and cities that focused on the steel and iron industry emerged in north and north-central Alabama. Boll weevil damage to cotton crops in 1915 and exorbitant shipping charges caused farmers to concentrate on raising livestock and crops other than cotton. Coal mining also increased and brought new industry and economic opportunities to relatively poor regions of the State. In the 1930s, low-cost power provided by the Tennessee Valley Authority (TVA) encouraged industrial development and provided some rural residents with electricity for the first time. Alabama industry and farming further prospered under the demands of World War II (Rogers 1994). Alabama retained segregation as a policy until the civil rights movement from the 1950s through 1960s. Many of the major events and court cases that defined the modern civil rights movement in the United States took place in Alabama, including equal access for black americans to public and private transportation, schools, voting booths, economic opportunities, and housing. Manufacturing remained the dominant economic sector through the 1990s. Alabama’s gross product also received significant contributions from the government and service sectors.

Cultural Resource Sites

Prehistoric or historic cultural resource sites, structures, or objects listed on or eligible for listing on the National Register of Historic Places (NRHP) are protected and managed as directed by 36 CFR 800. A resource is considered eligible for listing in NRHP if it is at least 50 years old, unless of exceptional historical significance; retains integrity of location, design, setting, materials, workmanship, feeling, and association; and has one or more of the following characteristics:

- Associated with events that have made a significant contribution to the broad patterns of history
- Associated with the lives of persons significant in its past
- Embodies the distinctive characteristics of a type, period, or method of construction
- Represents the work of a master, has high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction
- Yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

Cultural resources found ineligible for the NRHP require no further archaeological work and are not protected by law. Sites identified as undetermined or unknown need additional work to determine the site's eligibility.

Under the Archaeological Resources Protection Act (ARPA; 16 United States Code [USC] Section 470hh), the nature and location of any archaeological resource cannot be disclosed to the public unless the Federal land manager determines that such disclosure would provide further protection and there is no risk of harm to the site. To adequately address the existing condition of these resources while protecting their importance, only the general types of resources are discussed herein.

Records were searched for 2,847 non-USFS FMO tracts in Alabama. The records revealed 1,348 cultural sites within the BLM-administered non-USFS FMO tracts, of which 315 were considered eligible for NRHP. Components of these sites ranged from Paleoindian to 20th-century historic. Most of the tracts have never been surveyed. There is a high potential for finding additional archaeological sites.

Records were searched for scattered BLM surface tracts in Alabama. None of the BLM surface tracts contain previously recorded NRHP properties. Thirteen sites were recorded within one-half mile of the BLM surface tracts and could provide information on the potential for occurrence sites on adjacent BLM surface tracts; however, these sites are not and will not be affected by BLM activities and management. Identified cultural sites are summarized in Table 3-6.

Table 3-6. Cultural Sites on BLM Surface and non-USFS FMO Tracts in Alabama

Tract Type	Total Sites	NRHP Status		
		Potentially Eligible/ Eligible	Ineligible	Undetermined/ Unknown
Non-USFS FMO Tracts	1,348	315	669	364
Surface Tracts[1]	0	0	0	0
Areas Adjacent to Surface Tracts[2]	13	0	13	0

1 Sites located on surface, belong to surface owner.
2 Reflects sites within one-half mile of the surface tract boundaries.

3.2.9 Visual Resources

Visual resources consist of the natural and manmade features that contribute to a particular environment's aesthetics. These features may be natural (e.g., canyon views) or manmade (e.g., city skyline). Together, they form the overall impression of an area referred to as the landscape character. Visual resources also have a social setting, which includes public values, awareness, and concern about visual quality. Visual Resource Management (VRM) classifications are established for public lands so that visual resource values can be maintained through informed management decisions.

The visual resource inventory process contained in *BLM Handbook* H-8410-1 provides BLM managers guidance for determining visual values. The inventory consists of scenic quality evaluation, sensitivity-level analysis, and delineation of distance zones. Based on these three factors, BLM-administered lands are placed into one of four visual resource inventory classes. These inventory classes represent the relative value of the visual resource: Classes I and II are the most valued, Class III represents a moderate value, and Class IV has the least value. Management objectives have been assigned to each class. An area may be inventoried as VRM Class III, but a decision may be made to manage it as VRM Class IV, or vice versa. Cultural modifications may detract from the scenery, complement it, or improve the overall scenic quality of an area. Cultural modifications in landform/water and vegetation values and addition of structures will be considered in examining proposed resource management actions.

The following VRM Class objectives from *BLM Handbook* H-8410-1 have been amended for the purpose of developing and implementing this resource management plan (RMP). Amendments incorporate the visual resource values provided by existing cultural features that are significant to the character of the landscape in Alabama and Mississippi.

- **VRM Class I Objective:** The objective of this class is to preserve the existing natural and cultural character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not detract from the existing landscape character.
- **VRM Class II Objective:** The objective of this class is to retain the existing natural and cultural character of the landscape. The level of change to the characteristic should be low. Management activities may be visible but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural and/or cultural features of the characteristic landscape.
- **VRM Class III Objective:** The objective of this class is to partially retain the existing natural and cultural character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may be visible but should not dominate the view of the casual observer. Changes should blend with the natural environment.
- **VRM Class IV Objective:** The objective of this class is to provide for management activities that require significant modification of the existing landscape or the existing character of the natural and cultural landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of the casual observer's attention; however, every attempt should be made to minimize the impact of these activities through selective location, minimal disturbance, and repetition of basic elements.

3.2.10 Minerals

There are 313,819 acres of non-USFS FMO in Alabama that underlie various surface ownership. Surface owners include BLM, the Department of Defense (DoD), USFWS, National Park Service (NPS), and other Federal agencies. Table 3-7 shows BLM-administered FMO by surface ownership in Alabama.

Table 3-7. BLM-administered Federal Mineral Ownership by Surface Ownership in Alabama

Surface Owners	Federal Mineral Ownership (Acres)
BLM	159
DoD	1,495
NPS	3,300
USFWS	3,384
Other Federal Agencies	2,041
Non-Federal surface	303,440

Surface Owners	Federal Mineral Ownership (Acres)
TOTAL non-USFS FMO	**313,819**
USFS	585,394
TOTAL FMO (included USFS FMO)	**899,213**

Minerals—Oil and Gas

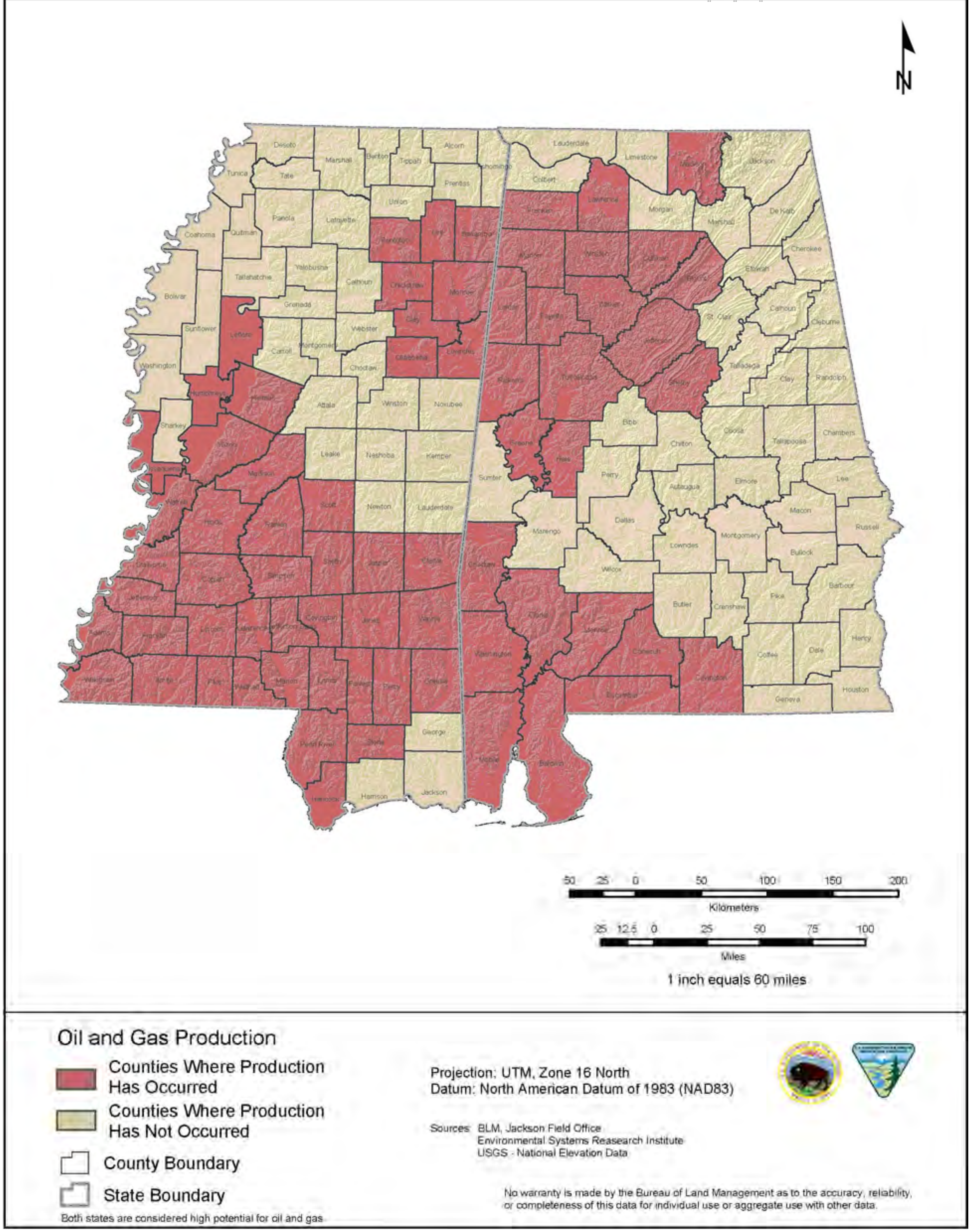
Oil and gas exploration began in Alabama in 1884 with the drilling of the Trowbridge #1 well near Bladen Springs in Choctaw County. This first well was a dry hole with a depth of 1,345 feet. Eighteen years later (1902), the New York–Alabama Oil Company discovered the Huntsville Gas Field, which started the commercial extraction of oil and gas in the southeastern States. As of April 2005, there were 31 active oil and gas wells on BLM-administered non-USFS FMO according to data from the Automated Fluid Mineral Management System.

According to available data from the Alabama Oil and Gas Board on Alabama oil and gas production from 1992 to 2002, oil production steadily decreased from 19,328,444 barrels to 8,631,227 barrels. During the same period, gas production increased from 336,129,406 thousand cubic feet (mcf) in 1992 to 388,631,710 mcf in 2002. Gas production peaked in 1995 at 438,838,497 mcf. As of April 2005, 136 Federal leases are authorized in Alabama. There area 30 existing leases on non-USFS FMO and 106 existing leases on USFS FMO.

Map 3-2 shows counties in Alabama with historical oil and gas production. Reasonable foreseeable development is anticipated in the areas of historical oil and gas production (BLM 2004). The areas of historical production are the Warrior Basin and the southern Alabama Basin. BLM projects that 20 wells accessing non-USFS FMO in Alabama would be drilled over the next 20 years (BLM 2004).

Map 3-2: Oil and Gas Production

Alabama-Mississippi RMP-EIS



Both states are considered high potential for oil and gas

Projection: UTM, Zone 16 North
Datum: North American Datum of 1983 (NAD83)

Sources: BLM, Jackson Field Office
Environmental Systems Reasearch Institute
USGS - National Elevation Data

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

Warrior Basin[1]

The roughly triangle-shaped Warrior Basin covers approximately 35,000 square miles in parts of Alabama, Arkansas, Georgia, Mississippi, and Tennessee. The northern boundary of the Warrior Basin is formed by the Ozark Uplift to the northwest and the Nashville Dome to the northeast. To the east and southeast, the basin is bound by the Appalachian system, and the Ouachita Fold and thrust belt bound the basin on the west and southwest.

Most of the oil and gas production is from the Mississippian and Pennsylvanian strata. The basin has a variety of trapping mechanisms with possibilities for multiple pay zones, which has led to a success rate of more than 50 percent. The Carter Sandstone of the Parkwood Formation is the most prolific oil- and gas-producing reservoir; however, a considerable amount of petroleum is produced from the Chandler and Nason Sandstones of the Pottsville Formation.

The major targets for coalbed natural gas production are the major coal groups in the Warrior Coal Field. These groups are the Black Creek, Mary Lee, and Pratt coal groups. However, all the coals can be potential sources of coalbed natural gas (BLM 2004). Most of the coalbed natural gas wells in this area are producing from coals between 15 to 25 feet thick and at depths between 500 and 3,000 feet. The median product per well is 82 mcf per day.

Southern Alabama Basin

These lands are in an area dominated by the Gulf Coast geosyncline. This large basin was formed in the Jurassic period with a southward downwarping. The basin has accumulated sedimentary deposits as much as 30,000 feet thick. Zones of faults parallel the basin hinge line and can trap hydrocarbons (Murray 1964). Other structural features, such as small basement highs, also trap hydrocarbons.

The deposits in the major geologic units of southern Alabama mainly consist of alternating layers of sand and clay, with occasional beds of carbonates and anhydrite. Permeable horizons exist in all formations, and oil and gas are produced from each horizon in the region, with the Haynesville, Smackover, and Norphlet Formations having more importance (Cate 1982; Poe 1979; May 1974; Moore 1971; Dinkins 1968).

Leasable Minerals—Coal

There are three major coal fields in Alabama—the Coosa Coal Field, Cahaba Coal Field, and Warrior Coal Field. Farthest to the southeast, the Coosa Coal Field covers approximately 134,400 acres in Jefferson, Shelby, and St. Clair Counties in an elongated syncline along the trend of the Appalachian Mountains. Southwest of the Coosa Field and separated by the Cahaba Valley, the Cahaba Field includes approximately 230,400 acres of Bibb, Shelby, St. Clair, and Jefferson Counties. The largest of the three coal fields in Alabama, the Warrior Coal Field, includes approximately 2,324,470 acres in Walker, Fayette, Jefferson, and Tuscaloosa counties.

Consideration of Alabama coal leasing in this RMP is limited to the Warrior Coal Field. Coal leasing potential within the planning area is limited to the Warrior Basin in Alabama because of the distinctive presence of the appropriate geological conditions (e.g., continuity of coal beds, thickness of coal, quality of coal seams) and existing infrastructure (e.g., existing subsurface mining operations and access roads) for development of coal resources. Non-USFS FMO available for coal leasing is located in Walker, Fayette, Jefferson, and Tuscaloosa counties.

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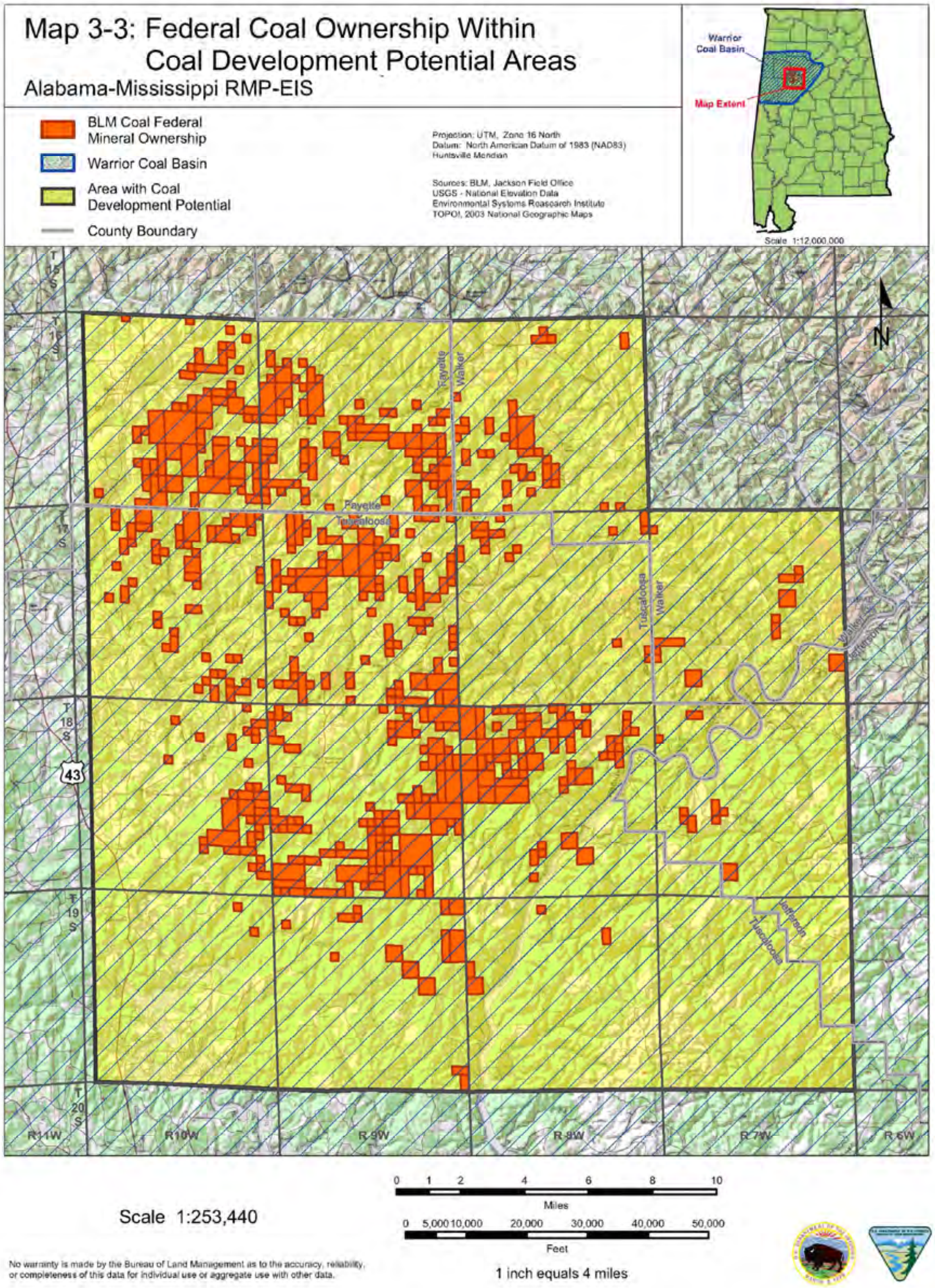
[1] The term Warrior Basin is a geologic province. The Black Warrior Basin is the drainage area of the Black Warrior River.

Within the Warrior Coal Field, BLM retains 70,610 acres of coal mineral rights, 45,950 acres of which have been identified as high potential for development in the reasonably foreseeable development scenario (RFDS). It is anticipated 9,000 acres of new Federal coal leases and 18.8 million tons of Federal coal would be produced (an average of 1.9 million tons per year) as part of existing underground mines with no new surface disturbance. This field includes two regions, the Plateau coal region and Warrior coal basin (Map 3-3). The Plateau coal region is composed of several coal-bearing areas in the upland regions of northeastern Alabama. Federal coal ownership in the Plateau coal region is limited to the Talladega National Forest. The Plateau coal region is the largest of the Alabama coal fields covering an area greater than all the other coal fields combined (2,880,0000 acres). The Warrior Basin is the most productive and covers 2,240,000 acres in Tuscaloosa, Jefferson, Lamar, Marion, Winston, Fayette, Cullman, Blount, and Walker Counties. These coalbeds in the Plateau coal region and the Warrior coal basin are the major targets for the recovery of coalbed natural gas in the area, but all the coals can be sources of potential coalbed natural gas reserves (BLM 2004). There is no BLM-administered surface in the Warrior coal basin. The Warrior coal basin contains more than 20 coalbeds, some of which are known to extend into the BLM-administered non-USFS FMO of Mississippi. Most coal in the Warrior Basin is high-volatile “A” bituminous. Coal thickness generally varies from a few inches to about 75 inches with ash content ranging between 3 and 15 percent, and the sulfur from 1.1 to 3 percent. The thickest and most economically valuable coals within the Warrior coal basin are located in Tuscaloosa, Walker, Fayette, and Jefferson Counties. Coal is also present to a lesser degree in Marion and Winston Counties, but the development of Federal coal in these counties is unlikely. However, because of the depth of the mines and the availability of other easily obtainable resources such as oil and gas, much of the coal resources within the Warrior Coal Field have yet to be developed (Tew and Mancini 1986). On the basis of current information on and availability of other fuel resources, coal development will likely continue at the current rate.



Map 3-3: Federal Coal Ownership Within Coal Development Potential Areas

Alabama-Mississippi RMP-EIS

Projection: UTM, Zone 16 North
Datum: North American Datum of 1983 (NAD83)
Huntsville Meridian

Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Research Institute
TOPO!, 2003 National Geographic Maps

Scale 1:253,440

1 inch equals 4 miles

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

3.2.11 Recreation and Travel Management

Recreation encompasses various human activities that affect and are affected by resources and other resource uses. Dispersed recreation is characterized by unstructured activities that are not confined to specific locations (such as developed recreation sites). Dispersed recreation can involve various activities, which on the Alabama surface tracts can include the following:

- Saltwater beach activities
- Hunting
- Fishing
- Bicycle riding
- Horseback riding
- Nature study
- Boating
- Picnicking
- Freshwater swimming
- Hiking
- Rock climbing

The BLM-administered non-USFS FMO includes the mineral estate where the surface is managed by another Federal surface management agency. These properties and installations managed by other Federal agencies as well as non-Federal agencies such as private, State, or county are summarized in Table 3-8 and shown on Map 1-1 and Map 1-2.

For those tracts where the surface is managed by other surface management agencies and where public access for recreation and oil and gas leasing are permitted, recreation experiences and resulting benefits could be affected by BLM-allowable uses and management actions proposed in this RMP. Information on public recreation and minerals leasing on other Federal surface management agencies is shown in Table 3-8.

Table 3-8. BLM-administered non-USFS Federal Mineral Ownership[1] by Surface Management Agency in Alabama

Surface Management Agency	Installations/Areas	Public Access for Recreation (Yes/No)[2]	Mineral Leasing (Open/Closed)[2]
USFWS	Bon Secour NWR	Yes	Closed
	Wheeler NWR	Yes	Closed
DoD	Barin Field (Navy)	ND	Open
	Summerdale Outlying Landing Field (Navy)	ND	Open
	Silverhill Outlying Landing Field (Navy)	ND	Open
	Fort Rucker Military Reservation (Army)	Yes	Open
	Fort McClellan Military Reservation (Army, Closed)	Yes	Open
	Anniston Army Depot (Army)	No	Open
	Redstone Arsenal (Army)	No	Open
	Lake Tholocco (Army Corps of Engineers)	Yes	Open

Surface Management Agency	Installations/Areas	Public Access for Recreation (Yes/No)[2]	Mineral Leasing (Open/Closed)[2]
	Coffeeville Lake (Army Corps of Engineers)	Yes	Open
	William Dannelly Reservoir (Army Corps of Engineers)	Yes	Open
	Maxwell Air Force Base (Air Force)	No	Closed
NPS	Little River Canyon Preserve	Yes	Closed
Other	Areas Managed by Other Federal Agencies	No	Varies

ND means no information was available from the surface managing agency.
1 Does not reflect BLM FMO for BLM surface tracts (159 acres).
2 Closed means closed to new leases. Existing leases could be present on areas currently closed.

BLM administration of travel resources in Alabama is limited to access routes and associated access/maintenance routes for ROW such as transmission lines. Public travel routes are administered and maintained by other Federal, State, and local agencies. Some surface tracts are adjacent to these travel routes. Information on tract-specific travel resources are contained in Section 3.3.

3.2.12 Lands and Realty

The goals of the lands and realty program are to manage the public lands to support the goals and objectives of other resource programs, provide for uses of public lands in accordance with regulations and compatibility with other resources, and improve management of the public lands through land tenure adjustments. The lands and realty program is a support program to all other resources to help ensure that BLM-administered lands are managed to benefit the public. Current conditions of lands and realty on the BLM-administered surface tracts is discussed in Section 3.3.

3.2.13 Social and Economic

The affected environment in Alabama centers on the counties in the coal region where energy minerals development could occur. Over the last 10 to 20 years, oil and gas development has occurred primarily in the counties with high potential for coal (BLM 2004). Therefore, the socioeconomic description is limited to the counties with high potential for coal: Tuscaloosa, Walker, Fayette, and Jefferson Counties.

Demographic, economic, and service data were collected from the U. S. Census, Bureau of Economic Analysis (BEA), and Bureau of Labor Statistics (BLS) from 1990 to 2002.

Economic Characteristics

Household and Personal Income

Median household income information for the four-county study area was obtained from the U. S. Census Bureau. In 2003, Jefferson County’s median household income of $38,558 is slightly higher than the median household income estimated for Alabama, which is $36,131. The median household incomes for Fayette, Walker and Tuscaloosa Counties ($30,133, $31,201, and $35,192 respectively) are slightly lower than Jefferson County and the State in 2003.

Information on per capita income was obtained from BEA. Jefferson and Tuscaloosa Counties reported higher per capita incomes ($36,041 and $28,833, respectively) than Walker and Fayette Counties

($24,734 and $22,073, respectively) for 2004. Jefferson and Tuscaloosa Counties' per capita incomes are higher than those of the State ($27,695) for 2004. Trend information on per capita income was also obtained from BEA and adjusted for inflation (Figure G-5). Jefferson County's per capita income averaged $33,065 over the 15-year period and has been consistently higher than the State average ($26,594). Over this same time period, the average per capita income for Tuscaloosa County ($27,136) has been similar to the State average, while Walker and Fayette Counties have had lower average per capita income ($24,221 and $21,902, respectively) than the State average.

Employment and Compensation

Information on employment by industry for the study area was obtained from BEA and U. S. Census County Business Patterns.[2] There were 610,890 estimated jobs in the study area in 2004, which represent 24.9 percent of the Alabama labor force. The 610,890 jobs were distributed among the industries shown in Figure G-7. Government and government enterprises (15.1 percent) composed the largest percentage of jobs. Retail trade (12.0 percent), health care (9.7 percent), and manufacturing (7.5 percent) were the next largest employers.

Unemployment trends information for the non-USFS FMO study area and the State of Alabama was obtained from BLS and are summarized in Figure G-4. The unemployment rates in Tuscaloosa and Jefferson Counties have remained below the State unemployment rate from 1990 to 2005. Walker and Fayette Counties unemployment rates were generally higher than the State's rate for the same time period. Overall, the unemployment trends of the four counties generally mirror the trend of the State, although Fayette County unemployment trends have greater magnitude in their movements.

In the four county study area, BLM administers the leasing of coal resources, allowing for the production of 1.9 millions tons of coal per year from these BLM minerals. In Alabama, mining (non oil and gas) accounts for approximately 6,773 employees and employee compensation of $482,361,000 (BEA, 2005). Currently coal produced from BLM-administered minerals accounts for approximately 10 percent of the total amount of coal produced in the State, 19.5 million tons of coal (Energy Information Agency, 1999). If 10 percent of this employment and employee compensation can be attributed to BLM-administered minerals, this activity provides for 677 employees in mining, with total mining employee compensation of $48,236,100. The average annual employee compensation for these workers is $71,218, compared with average annual compensation from all industries in the State of $34,877 (BEA, 2005). Mining in the four-county study area likely provides fiscal revenues to local and state governments, supporting community and emergency services, schools and infrastructure.

Oil and gas also provides employment and income within the four study county area. However, over the past 20 years, BLM has permitted 17 wells of a total of 8,068 wells permitted within the state. Therefore, although these BLM-administered oil and gas resources do contribute to employment and earnings in this area, it is a fairly small amount.

Social Characteristics

Demographics

Population trend data were obtained from BEA. Data for the non-USFS FMO study area between 1990 and 2004 are summarized in Figure G-1 (Appendix G). Total population in the combined study area in 2004 was 913,707 and comprised 20.2 percent of the population of Alabama. Jefferson County's population was the largest in 2004 with 658,468 residents. For the same year, Tuscaloosa County (167,178), Walker County (69,876), and Fayette County (18,185) populations were considerably smaller. All four counties experienced small population growth over the 15-year period. The total population in the combined study area increased by 2.8 percent from 888,982 in 1990 to 913,707 in 2002. The median age of the combined study area population in 2000 was estimated to be 35.6—slightly lower than the State median of 35.8 (U. S. Census 2000).

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[2] *U. S. Census County Business Patterns data was used to estimate employment by industry data that were not disclosed by the BEA.*

Housing

The average number of people per household in Walker County (2.46), Jefferson County (2.45), Fayette County (2.42), and Tuscaloosa County (2.42) are similar. The average number of people per family in Jefferson County (3.04), Tuscaloosa County (3.00), Walker County (2.93), and Fayette County (2.92) are also similar (BEA 2000). In the study area, 91 percent of the 363,639 housing units were occupied in 2000. Homeowners occupied 67 percent of the total housing units.

All four counties in the study area have low homeowner vacancy rates—1.9 percent in Jefferson County, 1.8 percent in Walker County, and 1.7 percent in Fayette and Tuscaloosa Counties. Rental vacancy rates are somewhat higher—14.1 percent in Walker County, 12.3 percent in Tuscaloosa County, 11.1 percent in Fayette County, and 10.2 percent in Jefferson County (U. S. Census 2000). The median value of owner-occupied housing units for Tuscaloosa and Jefferson counties ($106,600 and $90,700, respectively) were higher than the State median ($85,100). Walker and Fayette counties median value of owner-occupied housing units ($66,700 and $64,100, respectively) were lower than the State's median (U. S. Census 2000).

Educational Attainment

Educational attainment of the population that is 25 years of age and older varies between the four counties in the study area. In Jefferson County, 80.9 percent of the population has graduated high school or higher and 24.6 percent hold a bachelor's degree or higher (U. S. Census 2000). Tuscaloosa County has a similar populace, with 78.8 percent graduating high school or higher and 24.0 percent with a bachelor's degree or higher. The percentage of the population graduating from high school or higher for Walker and Fayette Counties is 67.2 percent and 66.1 percent, respectively, and those having a bachelor's degree or higher is 9.1 percent and 9.2 percent, respectively. The educational attainment in figures in Walker and Fayette Counties are lower than those in Jefferson and Tuscaloosa Counties.

Attitudes and Beliefs of Alabama Stakeholders

In Alabama, the BLM has responsibility for a number of issues and decisions that could be important to stakeholders and their beliefs, including Federal land disposal, mineral development, including coal and oil and gas. This section will briefly describe stakeholders' attitudes and beliefs related to these specific issues to provide a social context for these decisions.

Public lands are important in providing a natural resource base for economic activities. Oil and gas, as well as coal, development will be supported by some stakeholders and not by others. Stakeholders who support mineral development believe that domestic production of resources provides products on which the public relies heavily, generating economic and social benefits. Without the availability and access for development of these resources, stakeholders feel that many adverse impacts could occur, including trade gaps, increasing prices, and strategic vulnerabilities. Additionally, the mineral industries have contributed to the tax base of both counties and the State, providing funds for local, regional, and State governments, infrastructure, schools, and other community services. Many people believe that this funding is vital to the economy of Alabama Counties and the State. Some stakeholders will support these mining activities due to the economic benefits in income, jobs, and government revenues, while others will be concerned that the economic benefit may not offset the risks to environmental and water resources from the activity.

Conservation-focused stakeholders may not support mineral development or might support conditions and stipulations on development and production to reduce negative impacts to the surface and subsurface. These environmental stakeholders are concerned about erosion and water quality impacts associated with road and wellpad construction as well as water disposal in the production process. Some stakeholders believe that the potential long-term environmental risks of development are considerable compared to the short-term benefit of the resource extracted. Additionally, these types of stakeholders believe that mineral development impacts such as increased road building, associated road traffic, dust, and noise add to the negative impacts associated with this type of development.

Public land disposal may also be a contentious issue with the public. The BLM in Alabama manages a number of pocket properties scattered across the State, totaling 159 acres. Preservation-oriented stakeholders are concerned about protecting open spaces and limiting development on these lands, often to maintain a quality of life that the property provides. For example, quality of life attributes could include recreation, such as bird-watching or walking, solitude, and the knowledge that the property provides important wildlife habitat. Therefore, these types of stakeholders believe that keeping the surface lands in Federal ownership is preferable or selling these lands to organizations interested in preserving the lands. Developers might be interested in purchasing these lands for their economic value due to their location on the coast if the lands are buildable. Additionally, some people may feel that disposing of Federal lands provides important fiscal revenues as private property taxes can be collected.

Environmental Justice

Environmental justice is another component of the community that considers minority or low-income populations to determine whether or not any of the proposed alternatives have a disproportionately high and adverse human health or environmental effect on those populations. Environmental justice analysis is conducted in compliance with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. On the basis of Council on Environmental Quality (CEQ) guidance, minority populations should be identified where (a) the minority population of the area exceeds 50 percent; or (b) the minority population percentage of the affected area is significantly greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.[3] Low-income populations are defined as those below the Federal poverty thresholds. Those populations are identified using statistical poverty thresholds from the Bureau of Census—$17,463 for a family of four (U. S. Census 2000). EPA identifies a low-income community as an area with a significantly greater population of low-income families than a statistical reference area.[4] For the purposes of this socioeconomic analysis, low-income population areas will be defined as an area where the low-income population exceeds 20 percent poverty or if isolated pockets of large low-income populations are present.

The poverty levels in three of the four counties (Fayette, Tuscaloosa, and Walker Counties) are higher than the Statewide estimate of 16.1 percent, as summarized in Figure G-2. Fayette County has the largest percentage of the population below the poverty level (17.3 percent). Jefferson County has the smallest percentage of the population below the poverty level (14.8 percent). The poverty levels in all four counties are below the set threshold of 20 percent for low-income populations, and therefore do not represent environmental justice populations. In comparison, in 2004, there were 19 of a total of 67 counties in Alabama that had populations that were greater than 20 percent in poverty status.

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[3] *Council on Environmental Quality, Environmental Justice Guidance Under the National Environmental Policy Act, 1997.*

[4] *Environmental Protection Agency, Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis, 1998.*

The ethnicity data for the study area in Figure G-3 were also obtained from the U. S. Census Bureau. The four-county study area is predominantly white (62.4 percent). The remaining race distribution in the study area includes Black or African American (34.3 percent), Hispanic or Latino (1.4 percent), Asian (0.8 percent), two or more races (0.7 percent), American Indian or Native Alaskan (0.2 percent), other race (0.1 percent), and Native Hawaiian or other Pacific Islander (0.0 percent). The ethnic representation in the study area is similar to race distribution for the State, but has higher Black or African American estimates. The overall percentages of minority populations in Walker County (8.3 percent) and Fayette County (13.5 percent) are lower than the minority percentage for Alabama (29.7 percent), whereas the minority percentages for Tuscaloosa County (32.5 percent) and Jefferson County (42.6 percent) are higher than the State's percentage. However, the minority percentages for all four counties are below the CEQ threshold of 50 percent and not significantly higher than the State average of 29.7 percent.

3.2.14 Hazardous Materials

BLM-administered public lands and minerals provide opportunities for a variety of commercial uses in addition to resource management. Both activities can lead to releases of hazardous substances and creation of hazardous waste sites. The BLM engages in hazardous material emergency response actions, site evaluations, and prioritization of cleanups in accordance with laws and regulations. This involves working with the EPA, State environmental quality departments, counties, and potentially responsible parties (both public and private) to fund and expedite the cleanup of hazardous sites. Those sites that are an imminent threat to public health and safety, as well as those sites that are under a consent order and can therefore generate penalties and fines, are a priority for the Bureau. There are no known hazardous, toxic, or unapproved solid waste sites on public lands within the planning area.

3.3 ALABAMA SURFACE TRACT DESCRIPTION

The surface tract descriptions in this section include available detail on each of the surface tract groupings described in Chapter 2. General information and tract-specific information on soil resources, water resources, vegetative communities, fish and wildlife, special status species, cultural resources, visual resources, recreation and travel management, and lands and realty are provided for each tract grouping. Air quality, wildland fire ecology and management, minerals, and social and economic conditions are discussed in Section 3.2

General. This section provides basic location and size of the surface tracts, as well as available background information.

Soil Resources. This section provides a table of the soils present at the tracts, the erosion hazard potential as indicated by NRCS, and the presence of prime or unique farmlands (defined in Section 3.2.2).

Water Resources. This section describes which drainage basin the surface tract is within.

Vegetative Communities. This section summarizes the vegetative communities related to the tracts. An analysis of the available GAP data was used to delineate the vegetative communities on the surface tracts. The GAP is coordinated by the Biological Resources Division of the U. S. Geological Survey (USGS).

Fish and Wildlife. This section summarizes the fish and wildlife species associated with the tracts. GAP provides geographic information on the status and location of species and their habitat. The GAP is coordinated by the Biological Resources Division of USGS.

Special Status Species. This section summarizes the special status species associated with the tracts. GAP provides geographic information on the status and location of species and their habitat. The GAP is coordinated by the Biological Resources Division of USGS. Available special status species occurrences on the tracts are discussed. Appendix E provides additional information on special status species in the areas around the surface tracts.

Cultural Resources. This section summarizes the known sites and cultural resources survey information for the surface tracts.

Visual Resources. This section addresses the visual setting of BLM-administered surface tracts. The surface tracts are not currently classified according to a VRM system. VRM Classifications are described in Section 3.2.9. The surface tracts in Alabama have not been inventoried for VRM classification.

Recreation and Travel Management. This section addresses the existing recreational and travel management activities on BLM-administered surface tracts.

Lands and Realty. This section addresses the lands and realty actions associated with surface tracts, including withdrawals, disposals, and ROW actions.

3.3.1 Coosa River Tracts

General

The Coosa River tracts are 12 island tracts totaling approximately 42 acres in Calhoun, Coosa, Shelby, and Talladega Counties. These tracts are Federally-owned, surveyed islands that have never been patented to private ownership. The islands range from water level to only a few feet above water level.

Soil Resources

There is no soil classification for this tract. The tracts are characterized as vegetated islands in the middle of the Coosa River.

Water Resources

All the Coosa River tracts are located within the Coosa River drainage basin.

Vegetative Communities

The Coosa River islands are located in areas inundated by a series of three dams constructed along the Coosa River between 1914 and the 1960s. The larger islands reflect the vegetation communities found in adjacent areas, primarily dry hardwood forest, with pine interspersed in the interior on the larger islands, in Lake Mitchell. On these islands, the hardwood component tends to be more diverse around the lower elevations of the islands and includes hickory (*Carya spp.*); common persimmon (*Diospyros virginiana*); sweetgum (*Liquidambar styraciflua*); southern hackberry (*Celtis occidentalis*); eastern sycamore (*Platanus occidentalis*); southern red oak (*Quercus falcata*); water oak (*Quercus nigra*); and loblolly pine (*Pinus taedai*). The interior of the islands are generally dominated by larger water oak and loblolly pine with diameters up to 24 inches and 70-80 inches tall. The understory is relatively clear with young red maple (*Acer rubrum*); common wax myrtle (*Myrica cerifera*); blueberry (*Vaccinium* spp.); American beautyberry (*Callicarpa americana*); and bracken (*Pteridium aquiline).* There are some burn scars on larger pine, indicating past burns on some of the islands. Big Rock Island in Mitchell Lake rises approximately 120 feet above the lake and as its name denotes has sheer rock faces around much of the island, with seepage areas, ferns, and Spanish moss draping these areas. Smith and Prince Islands above Mitchell Lake tend to be flatter, lower, and dominated by mature water oak, with the additional species such as silver maple (*Acer saccharinum*), ashleaf maple (*Acer negundo*), and southern catalpa (*Catalpa bignonoides*). The leading edges of the smaller islands in the main river channel show signs of eroding, with downed trees and bare soils. The most northerly of the Coosa River tracts in Calhoun County was not visited, but from aerial photos it appears to be a sandbar with little or no vegetation.

Chinese privet (*Ligustrum sinense),* Japanese honeysuckle (*Lonicera japonica*), and mimosa tree (*Albizia julibrissin*) are present on most of the islands. Chinese privet occurs on the edges of the flatter islands north of Mitchell Lake and particularly frequently on the eroding leading edges of some islands. The Alabama Power Company treats aquatic invasive plant species throughout much of Coosa River. In 2002, over 200 acres were treated for emergent and submersed aquatic invasives in Lay, Jordon/Bouldin, and Mitchell Lakes, including alligator weed (*Alternanthera philoxeriodes*), floating water hyacinth (*Eichhornia crassipes*), parrot-feather (*Myriophyllum aquatica*), and spinyleaf naiad (*Najas minor*) (http://www.southerncompany.com/alpower/hydro/pdfs/E7_Issue_Recommendations.pdf).

Fish and Wildlife

The Coosa River islands provide a variety of shoreline habitats for resident and migratory wading birds, including great blue heron, black-crowned night heron, and little blue heron. The wetland and upland habitats on the islands provide nesting habitat for neotropical migrants, such as prothonotary warbler, summer tanager and solitary vireo, and year-round residents such as belted kingfisher, rufous-sided towhee, Carolina wren, and downy woodpecker. Typical reptiles include midland water snake (*Nerodia sipedon pleuralis)* and common five-lined skink *(Eumeces fasciatus).* Those tracts outside of Mitchell Lake, particularly the Calhoun County tract, could provide basking areas and even nesting sites for river turtles. Typical mammals would include otter (*Lutra canadensis*), mink (*Mustela vison),* and raccoon (*Procyon lotor*), while armadillo (*Dasypus novemcinctus*) are common in the upland areas of larger islands.

Special Status Species

A bald eagle nest was located on these islands in 2005. Most of the larger islands support suitable nest trees and roosting habitat, and the Coosa River provides optimal foraging habitat. The islands do not provide suitable nesting habitat for red-cockaded woodpecker, although some of the larger islands provide marginally suitable foraging habitat.

There are no known records of Federally-listed plants on the Coosa River islands; however, there have been no surveys of the tracts.

Cultural Resources

The Coosa River tracts have not been surveyed. However, two cultural sites are located within one-half mile of four tracts—the single tract in Calhoun County and three tracts in Talladega County.

Visual Resources

The islands that make up the Coosa River tracts are visible from the shore; there is little or no development or other human activity on the shores opposite the islands, except for residences opposite Prince Island.

Recreation and Travel Management

The Coosa River tracts are used for dispersed recreation. Opportunities for recreation on the islands, however, are limited by their small size and the fact that they are only accessible through travel by water. Fishing, picnicking, rest stops of boaters and canoeists, and wildlife observation are examples of recreation opportunities on the islands.

Although use on the islands is limited, they are identified as supporting water-based recreation opportunities by the Coosa River Recreation Plan (Alabama Power Co. 2005). The lakes that surround these islands (Mitchell Lake, Lay Lake, and H. Neely Henry Lake) are all popular for recreation activities such as boat fishing, pleasure boating, swimming, and picnicking. In 2000, these three developments combined to support 1,134,400 recreation days. Boat fishing was by far the most popular activity with 989,100 recreation days. Lay Lake hosted the 2007 Bassmasters Classic fishing tournament, and smaller tournaments are regularly held on these lakes.

Lands and Realty

All of the Coosa River Islands are within areas impounded for hydroelectric purposes. Big Rock Island, Little Rock Island, and the Foshee Islands are in Mitchell Lake; Smith Island and Prince Island are in Lay Lake; and the unnamed island is within H. Neely Henry Lake. These projects are licensed under the authority of the Federal Water Power Act of 1920, which created the Federal Power Commission (FPC), now the Federal Energy Regulatory Commission (FERC). Mitchell Dam was originally licensed as Project No. 82, and Lay Dam and H. Neely Henry Dam were included in Project No. 2146. Now, these projects are combined for licensing purposes as Project No. 2146-111.

Public domain lands within project areas were withdrawn for water power purposes. After projects were completed FPC often relinquished the withdrawal of the lands no longer needed for project purposes. In the case of the Coosa River Islands, this generally included relinquishment of the land above the water level. For example, in 1955 the land withdrawn for the Mitchell Dam (Project No. 82) was modified to include only the land below the 360 foot elevation contour.

There are historical records of application to acquire some of the Coosa River Islands. In 1959, for example, the State of Alabama Department of Conservation applied for Big Rock Island, Little Rock Island, and the Foshee Islands under the Recreation and Public Purposes (R&PP) Act, but the application was later withdrawn. In addition, several color-of-title applications were submitted in the 1950s, but all were rejected.

There are no BLM-authorized ROW or other uses on the Coosa River Islands. A power line, however, crosses the southern end of Prince Island (with no ground supports on the island).

3.3.2 Fort Morgan Beach Tracts

General

Seven tracts in Baldwin County totaling 28.7 acres comprise the Fort Morgan Beach tracts. These tracts provide access recreation activities on the gulf and its beaches, which were severely damaged by Hurricane Ivan in 2004. Boardwalks partially destroyed by Ivan may be rebuilt. These tracts fall within the CZM Program.

Soil Resources

The soil classification for this tract is displayed in Table 3-9.

Table 3-9. Soil Classification for the Fort Morgan Beach Tracts

Soil Type	Description	Erosion Hazard	Prime Farmland
Coastal beaches	Moderately deep and poorly drained to excessively drained soils that border saltwater and freshwater lakes	None	No

Water Resources

The Fort Morgan Beach tracts are located within the Mobile River drainage basin.

Vegetative Communities

The Fort Morgan Beach tracts border the Gulf of Mexico and include back beach, primary dunes, and in some cases extend landward sufficiently to encompass secondary dunes. Throughout these tracts, the dominant species is sea oats (*Uniola paniculata*). Other species characteristic of this habitat include marsh-elder (*Iva frutescens*), and Gulf bluestem (*Schizachyrium maritimum*), sandhill rosemary (*Ceratiola ericoides*), woody goldenrod (*Chrysoma pauciflosculosa*), beach sand-squares (*Paronychia erecta*), and Gulf rockrose (*Helianthemum arenicola*). These tracts, along with the rest of the Fort Morgan peninsula, were heavily impacted by Hurricane Ivan in 2004, when storm surges inundated much of the peninsula. Coastal dunes throughout this area were destroyed and dune vegetation was obliterated. These dunes are dynamic systems adapted to these storm cycles. Since Hurricane Ivan and other major storms that hit this coastline in 2005, these dunes have continued to accrete, accelerated by pioneering sea oats. There are no known exotic plant species identified on the Fort Morgan Beach tracts.

Fish and Wildlife

The coastal dunes and back beach areas of the Fort Morgan Beach tracts provide important foraging habitat for a host of shorebirds, gulls, terns and others, such as Wilson's plover, willet, sanderling, short-billed dowitcher, ring-billed gull, royal tern, and black skimmer. Feral and domestic cats are a management concern in this area because of predation on beach mice and nesting shorebirds.

Special Status Species

All of the Fort Morgan Beach tracts are designated critical habitat for Alabama beach mouse and contain primary dunes, the preferred habitat for this species. Populations are recovering after Hurricane Ivan inundated much of this area in 2004, and Alabama beach mouse was found on BLM beach tracts in early February 2007 (Matt Falcey, personal communication). The tracts also provide nesting habitat for loggerhead sea turtle, and potentially green sea turtle and Kemp's Ridley sea turtle. The adjacent Bon Secour NWR has documented loggerhead nests to be 4.5 to 5 nests per mile, higher than many areas along the Gulf Coast (USFWS 2004). The tracts also provide habitat for wintering piping plover, likely a mixture of the threatened Atlantic Coast and endangered Great Lakes populations, although the designated critical habitat for wintering piping plover at Fort Morgan is west of the BLM tracts. Snowy plover, Wilson's plover, and American oystercatcher are known to nest on the refuge. There are no known records of Federally-listed plants on these tracts.

Cultural Resources

The Fort Morgan Beach tracts have been surveyed. Four cultural sites are located within one-half mile of three of the beach tracts.

Visual Resources

Visual features of the Fort Morgan Beach tracts include sand dunes, beach and open sea, mixed vegetation, boardwalks, and adjacent residential and other development.

Recreation and Travel Management

The Fort Morgan Beach tracts provide access for recreational use of the beach, including saltwater fishing. There are no developments on the tracts, but some parking is available on adjacent roadways. In 2004, the vast majority of recreational use of similar tracts on the nearby Bon Secour NWR was classified as either beach/water use or saltwater fishing. There were a total of 53,395 visits for these two activities with 32,721 of the visits by residents, defined as people living within 30 miles.

Lands and Realty

In the early 1950s, much of the remaining public domain land on the Fort Morgan Peninsula was classified (by Alabama Small tract Classification Orders No. 1 and 2) for disposal pursuant to the Small tract Act of 1938. This land was subdivided into about 190 lots ranging in size from 0.72 to 2.61 acres. By 1960, the BLM had sold most of the lots, many to World War II veterans who were given a statutory preference.

The lots identified in this document as the Fort Morgan Beach tracts were not classified for disposal, and were specifically "set aside" by the classification orders "and reserved as recreation areas for use by the general public." The classification orders also reserved "a 33-foot ROW for roads and public utilities" on the border of each lot. The legacy of the Small tract Act is still evident in the land use patterns in the area immediately surrounding the Fort Morgan Beach tracts. Other than the ROW reserved by the small tract classifications, there are no authorized uses on the Fort Morgan Beach tracts.

3.3.3 Fort Morgan Highway Tracts

General

The Fort Morgan Highway tracts are located in Baldwin County along the Dixie-Graves Highway (SH 180), which provides access to the end of the Fort Morgan Peninsula. There are five tracts totaling approximately 41 acres within this tract group. High-density development and highway expansion near these tracts could be planned for the future.

Soil Resources

The soil classification for the tracts is provided in Table 3-10.

Table 3-10. Soil Classification for the Fort Morgan Highway Tracts

Soil Type	Description	Erosion Hazard	Prime Farmland
Leon sand	Deep, poorly drained, nearly level soils on uplands; sandy surface layers and sandy and loamy subsoils	Slight	No
St. Lucie sand, 0 to 5 percent slopes	Deep, excessively drained, nearly level to steep soils on undulating ridges and short side slopes on uplands; sandy surface layers and underlying material	Very Severe	No
St. Lucie–Leon–Muck complex	Deep, poorly drained, nearly level soils on uplands; sandy surface layers and sandy loamy subsoils	None to Severe, depending on water saturation	No

Water Resources

The Fort Morgan Highway tracts are located within the Mobile River drainage basin.

Vegetative Communities

The narrow Fort Morgan Highway tracts are dominated by a sand pine/oak scrub plant community with scattered clusters of slash pine. Pine coverage is generally 10 to15 percent and trees are generally 5 to 10 inches diameter at breast height. In the more xeric sites, the shrub layer is dominated by 8 to 12 feet tall scrub oak species, including scrub live oak (*Quercus geminata*) and myrtle oak (*Quercus myrtifolia*). Other understory species include rosemary (*Conradina canescens*), gopher apple (*Licania michauxii*), St. John's wort (*Hypericum crux-andreae*), and saw palmetto (*Serenoa repens*). Reindeer lichen (*Cladonia rangifera*) and British soldier (*Cladonia cristella*) occur as a groundcover in protected areas of the scrub.

These highway tracts were inundated by Hurricane Ivan's storm surge in the fall of 2004. Although direct damage from wind was minimal, low areas where brackish waters stood for extended periods resulted in die-offs of pine and saw palmetto. A 30 foot utility corridor has been cleared on the southern edge of the tracts and contains more ruderal species, including blackberry/dewberry (*Rubus spp.*), groundsel-tree (*Baccharis halimfolia*), and common wax myrtle (*Myrica cerifera*).

In Lot 5 and 15, there are a small series of isolated wetlands dominated by sawgrass (*Cladium jamaicense*) with scattered patches of needlerush (*Juncus roemerianus*) and fringed by saw palmetto (*Serenoa repens*). Wild hibiscus (*Hibiscus grandiflora*), arrowhead (*Sagittaria lancifolia*), and titi (*Cyrilla racemiflora*) are also common in these low lying areas. Both of these tracts show evidence of a previous burn.

Cogon grass (*Imperata cylindrical*) and Chinese tallow both occur sporadically along disturbed edges of the Fort Morgan Highway tracts.

Fish and Wildlife

Fort Morgan Peninsula, and the Bon Secour NWR in particular, provide the best remaining stopover and staging habitats for neotropical migratory songbirds along the Alabama coastline. In addition, the area is famous for its fall hawk migration. Over 370 species of birds have been identified at the Bon Secour NWR during migration seasons (USFWS 2007). Both the Bon Secour NWR and the nearby Fort Morgan State Park are designated Globally Important Bird Areas by the American Bird Conservancy. Several locations on the Fort Morgan Peninsula are listed on the Alabama Coastal Birding Trail, including several close to BLM tracts.

Wetlands on Lots 5 and 15 of the Fort Morgan Highway tracts provide habitat for reptiles, amphibians, wading birds, and furbearers such as muskrat, mink, raccoon, and rabbit. The refuge has documented at least 15 species of turtles, 9 species of lizards, more than 30 species of snakes, and the American alligator (*Alligator mississippiensis*) in the area.

Special Status Species

The original critical habitat designation for Alabama beach mouse was recently modified to include the higher elevation scrub habitats determined to be important for the mouse during and after hurricane events (Federal Register, Vol. 71, No. 21, Wednesday, February 1, 2006). This expanded critical habitat includes all of the Fort Morgan Beach tracts.

Cultural Resources

The Fort Morgan Highway tracts have been surveyed. Four cultural sites are located within one-half mile of five of the highway tracts.

Visual Resources

The Fort Morgan Highway tracts are forested with pine and scrub vegetation and are generally flat. The visual setting is dominated by human activity.

Recreation and Travel Management

Recreation use on the Highway tracts is primarily associated with Highway 180 and the parkway corridor, which is designated as part the Alabama Scenic Byway. Activities along the highway corridor include driving and sightseeing, bicycling, and hiking. Several hiking trails on the Bon Secour NWR can be accessed from the parkway corridor. Historic Fort Morgan State Park at the end of the peninsula is a popular destination.

Lands and Realty

The Fort Morgan Highway tracts are within the same small tract area as the Fort Morgan Beach tracts. The plats of survey for the small tract area, however, made separate lots of the public domain lands within the 330-foot wide Dixie Graves Parkway. These lots are referred to in this document as the Fort Morgan Highway tracts, and were exempted from disposal by the small tract classification orders. While the BLM plats of survey identified the parkway as separate lots, there is no record that BLM granted any ROW or other authorized uses within the parkway lots.

3.3.4 Fowl River Tract

General

There is no legal vehicle access to this 41.73-acre tract in Mobile County. Adjacent land is privately owned. Bellingrath Gardens, a 65-acre estate with formal gardens, is located just north and the Dauphin Island is to the south. There are some adjacent homes, and a Shell oil refinery is located across the river about one-half mile east of the tract and homes are adjacent to the tract.

Soil Resources

The soil classification for this tract is provided in Table 3-11.

Table 3-11. Soil Classification for the Fowl River Tract

Soil Type	Description	Erosion Hazard	Prime Farmland
Bayou-Escambia association, gently undulating	Deep, moderately well-drained, nearly level soils on uplands and stream terraces; loamy and sandy surface layers and loamy subsoils low in clay	Slight	No
Lafitte muck, 0 to 1 percent slopes	Level, very poorly drained, moderately, and rapidly permeable soils; in brackish marshes adjacent to the Gulf of Mexico	Slight	No
Pactolus loamy sand, 0 to 2 percent slopes	Deep, moderately well-drained, and somewhat poorly drained, nearly level to gently sloping soils on uplands; sandy throughout	Moderate	No

Water Resources

The Fowl River tract is located within the Mobile River drainage basin.

Vegetative Communities

This tract is located on the western bank of the Fowl River and contains four wetland plant communities. These include an emergent wetland composed of black needlerush (*Juncus roemerianus*) and a scrub-shrub wetland dominated by black titi (*Clitftonia monophylla*), inkberry (*Ilex glaba*), common wax myrtle (*Myrica cerifera*), fetter-bush (*Lyona lucida*), and several species of pitcher plants and ferns. Portions of the tract are a seasonally flooded, hardwood-pine forest composed of sweetbay magnolia (*Magnolia virginiana*), sweetgum, loblolly bay (*Gordonia lasianthus*), Florida maple (*Acer barbatum*), various oak species, such as water oak, laurel oak (*Quercus laurifolia*), and flowering dogwood (*Cornus florida*), and saw palmetto (*Serona repens*), with grasses as the principal ground covers. A fourth type is a slash pine flatwoods with dahoon holly (*Ilex cassine*), gallberry (*Ilex coriacea*), and saw palmetto.

This tract was not surveyed for exotic/invasive plant species, but Chinese privet, tallow tree, mimosa, and Japanese honeysuckle occur in the area.

Fish and Wildlife

This wetland tract provides habitat for a variety of species in association with the adjacent river, wetland habitats, and flatwoods. The tract provides suitable foraging habitat for wading birds such as the great blue heron, black-crowned night heron, and snowy egret. The wetland habitats provide foraging and nesting habitat for both resident and neotropical migratory songbirds. Southern water snake *(Nerodia fasciata*), cottonmouth water moccasin (*Agkistrodon piscivorus)* are likely common on the tracts. Mammals are expected to include river otter *(Lutra canadensis)*, raccoon *(Procyon lotor)*, mink (*Mustela vison*), and gray fox (*Urocyon cinereoargenteus*).

Special Status Species

This tract could provide habitat for the endangered red-belly turtle (*Pseudemys alabamensis*). There are no known records of Federally-listed plants on this tract.

Cultural Resources

The Fowl River tract was surveyed for cultural resources in 1983 (Jackson Field Office files). No cultural artifacts were found during shovel testing. One cultural site is located within one-half mile of the tract.

Visual Resources

The geography of the Fowl River tract is low lying and consists of several types of wetlands and associated forest and scrub vegetation. The visual setting is low-lying wetlands with relatively dense vegetation and some human activity.

Recreation and Travel Management

The Fowl River tract lies on the western side of the Fowl River. A portion of the tract is a wetland and is intermittently flooded. The tract may be accessed from the river, but there is no terrestrial access for the general public. Neither Delchamps Road, which formerly crossed the southern end of the tract, nor the power line ROW, provide public access. The tract is likely used by local residents for dispersed recreation such as fishing, canoeing, and kayaking.

In the 1960s, the tract was proposed as a recreation site and was transferred to the Alabama Department of Conservation for recreation purposes. The tract reverted to BLM, however, because development as a recreation site proved to be infeasible.

Lands and Realty

On April 7, 1964, the Fowl River tract was patented to the State of Alabama, Department of Conservation for recreation purposes, under the R&PP Act. Under the terms of the patent, the site was required to be developed as a public recreation site. On October 8, 1976, the title to the tract was revested in the United States because the planned development had not occurred.

In 1983, BLM proposed the Fowl River tract for sale, but the tract did not sell. The fact that the sale was subject to a "covenant running with the land" to restrict use in floodplains may have been a contributing factor to the fact that the tract was not sold.

In 1990, BLM granted a power line ROW across the tract, running from west to east in the southern portion (lot 5) of the tract. There are no other BLM ROW or use authorizations on the tract.

3.3.5 Geneva Tract

General

The Geneva County tract consists of an approximately 1-acre sandbar in the bend of Choctawhatchee River (near the Florida State line).

Soil Resources

The is no soil classification for this tract. It is a sandbar adjacent to the river.

Water Resources

The Geneva tract is located within the Choctawhatchee River drainage basin.

Vegetative Communities

This very small (0.95 acres) tract is located on a bend on the East Fork of the Choctawhatchee River. As mapped, this tract is primarily a sandbar or open water. A 1997 aerial photo of the area shows the area dominated by pine, including a clear-cut on the opposite side of the river.

There are no exotic invasive plant species known to occur on the tract at this time.

Fish and Wildlife

This tract is likely used by wading birds and nesting river turtles.

Special Status Species

This portion of the Choctawhatchee River has been designated as critical habitat for the Gulf sturgeon.

Cultural Resources

The Geneva tract has not been surveyed. Three cultural sites are located within one-half mile of the tract.

Visual Resources

The visual setting of the Geneva tract is a river sandbar adjacent to dense forest vegetation.

Recreation and Travel Management

Because the Geneva County tract is remote and inaccessible, its value for public recreation is very limited. Any recreational use would probably be related to the use of the river and include activities such as canoeing, kayaking, and fishing.

Lands and Realty

According to subdivision of sections by a survey approved December 9, 1890, the Geneva County tract is identified as lot 4 in the northeast corner of section 22, west of the Choctawhatchee River. It is apparent that change of the river’s course has affected the boundaries of lot 4, which now may be at least partially in the channel of the river. There are no approved use authorizations on this tract, and no requests are expected.

3.3.6 Jordan Lake Tract

General

This 4.3-acre tract, located in Chilton County on the Coosa River below the Mitchell Dam (on the bank of Jordan Lake), is a steep, rocky slope with mixed hardwoods. The Coosa River Wildlife Management Area is located to the north and east of the tract.

Soil Resources

There is no soil classification for this tract. It is characterized as a rocky steep slope adjacent to the lake.

Water Resources

The Jordan Lake tract is located within the Coosa River drainage basin.

Vegetative Communities

The Jordon Lake tract is a very narrow strip of land on the west bank of Jordon Lake. North of State Highway 22, the steep shoreline is dominated by hardwoods, typically hickory, persimmon, sweetgum, hackberry, sycamore, southern red oak, water oak, and scattered loblolly pine. South of the highway, the tract is flatter with mature trees and little understory.

Fish and Wildlife

General wildlife use is similar to the Coosa Island tracts discussed above. The presence of multiple campsites in the area limits use of the area by more reclusive species.

Special Status Species

There are no records of Federally-listed plants or animals on this tract.

Cultural Resources

The Jordan Lake tract has been surveyed. Three cultural sites are located within one-half mile of the tract.

Visual Resources

The Jordan Lake tract sits high above the river and is visible from the highway as well as the homes across the river.

Recreation and Travel Management

This long, narrow tract is bisected by State Highway 22. The recreation opportunity of the Jordan Lake tract is primarily as an access to Jordan Lake for swimming and fishing. Due to the tract's location and size, however, its value as a public recreation site is very limited. The owners of the adjacent small tracts and their guests undoubtedly use the tract for travel access to the lake.

In 1966, the tract was transferred to Chilton County under the R&PP Act to be used for recreational purposes. Because of difficulty in managing the tract for recreation, the County filed a quitclaim deed in 2000 to revert the tract to the United States.

Lands and Realty

The Jordan Lake tract is an extremely narrow strip of land on the west side of Jordan Lake. This narrow strip was created by a peculiar set of circumstances. The fractional portion of section 14, west of the Coosa River, was withdrawn from the public domain by Power Site Classification No. 7, Alabama No. 1, approved July 30, 1921, (FPC Project 82). When the FPC relinquished withdrawal of lands above the 290-foot contour, BLM completed a resurvey in 1956 to subdivide the lands for disposal. The Jordan Lake tract (lot 1), because it was still withdrawn, had to be separated from the lands that were to be disposed. A 16.16-acre portion south of State Highway 22 was subdivided into 10 lots and classified for disposal under the Small tract Act of 1938. By 1960, all of the small tracts had sold, and several small houses, or fishing camps, were built on these lots adjacent to the BLM Jordan Lake tract.

By 1966, the FPC allowed the BLM to convey the Jordan Lake tract to Chilton County, Alabama, subject to a reservation under Section 24 of the Water Power Act. The Jordan Lake tract was patented to Chilton County under the R&PP Act to be used for recreational purposes only and subject to reversion to the United States. The reversionary clause was invoked on April 17, 2000 when Chilton County filed a quitclaim deed to re-convey the tract back to the United States.

The ROW for State Highway 22 was granted as a Federal Aid Highway under the Act of November 9, 1921 (42 Stat. 212). This highway crosses the narrow Jordan Lake tract (less than 100 feet wide at this point) at west side of the bridge that crosses the lake. There are no other ROW or authorized uses on the Jordan Lake tract.

3.4 MISSISSIPPI STATEWIDE PERSPECTIVE

3.4.1 Air Quality

Mississippi has a humid, subtropical climate characterized by temperate winters; long, hot summers; and an evenly distributed annual rainfall. The region is subject to periods of drought and flood, and the climatic conditions are rarely average. A feast-or-famine situation attributed to weather conditions is typically expected as the climate delivers energy and moisture in subtropical latitudes between a large landmass to the north and the Gulf of Mexico to the south (SERCC 2005).

Normal mean annual temperatures range from about 60°F in the north to 70°F along the coast. Temperatures regularly exceed 100°F throughout Mississippi and drop to zero or lower an average of once a year. Freezing temperatures reach the Gulf Coast almost every winter. Normal precipitation ranges from about 50 to 65 inches across the State from north to south (NOAA 2007a).

Air Quality Meteorology

Surface wind speeds vary depending on terrain and proximity to the coast. Average wind speeds vary from 6 to 10 miles per hour in most locations and follow water drainage features of the land or are driven by sea breezes. Dispersion can also be related to the NOAA Stagnation Index, which primarily focuses on ozone (NOAA 2005). On the basis of this index, Mississippi was prone to air stagnation on 25 to 50 percent of the days from May through September from 2002 – 2004. This dispersion index compares moderately to other areas in the country.

Baseline Air Quality

Ambient Air Quality. EPA has established ambient air quality standards for criteria pollutants considered harmful to public health and the environment. The ambient air quality measurements in Mississippi for SO_2, NO_2, CO, O_3, and PM_{10} and $PM_{2.5}$ are shown in Table 3-12. Ambient air quality measurements made by the Mississippi Department of Environmental Quality (MDEQ) indicate that ambient air quality is within standards. Ozone is formed from the chemical reactions of nitrogen oxides, VOCs, and sunlight. No exceedances of ambient air quality standards are noted.

Table 3-12. Recent Highest Ambient Air Quality Measurements in Mississippi[1, 2]

Pollutant	Averaging Time	Highest Measured Value (ppm^3)	Location	National Ambient Air Quality Standard (ppm^3)
SO_2	1 year	0.002	Pascagoula	0.03
	24 hours	0.019	Pascagoula	0.14
	3 hours	0.035	Pascagoula	0.50
NO_2	1 year	0.004	Hancock County	0.053
CO	8 hours	3.9	Jackson	9.0
	1 hour	5.0	Jackson	35.0
O_3	8 hours	0.096	Hancock County	0.080
	1 hour	0.112	Hancock County	0.120

Pollutant	Averaging Time	Highest Measured Value (ppm[3])	Location	National Ambient Air Quality Standard (ppm[3])
PM_{10}	1 year	18.0	Jackson County	50.0 µg/m3
	24 hours	41.0	Jackson County	150.0 µg/m3
$PM_{2.5}$	1 year	13.6	Hattiesburg	15.0 µg/m3
	24 hours	36.2	Hattiesburg	65.0 µg/m3

1 MDEQ Annual Data Summary 2003 (MDEQ 2004).
2 One-year maximum—this is not technically a violation until the fourth-highest value exceeds the design value of 0.085 ppm.
3 ppm = parts per mjllion

Visibility and Atmospheric Deposition. Visibility and atmospheric deposition measurements are not available for Mississippi.

Area Air Quality Designations

PSD of areas meeting the ambient air quality standards are divided into three categories: Class I for areas of restricted growth, Class II for areas of moderate growth, and Class III for industrialized areas (Clean Air Act of 1977, as amended). All of Mississippi is designated as PSD Class II.

In addition to this area designation for the entire State, other nearby Class I areas (within 100 kilometers of the potential development activities) include the Breton NWR off the coast of Louisiana (managed by USFWS) and the Sipsey Wilderness Area in northwestern Alabama.

3.4.2 Soil Resources

Physiographic Regions and Soil Types

The State of Mississippi is located entirely within the Coastal Plain Physiographic Province (Fenneman 1938). Most of the State is located within the East Gulf Coastal Plain section of the province, and the remainder is found within the Mississippi Alluvial Plain section. Within the East Gulf Coastal Plain, the physiography is characterized by a distinctive series of belts that largely reflect the underlying geology. Nine of the 10 physiographic regions are belts of the East Gulf Coastal Plain—Loess Hills, Flatwoods, Pontotoc Ridge, Black Prairie, Tombigbee Hills, Jackson Prairie, Longleaf Pine Belt, Coastal Pine Meadows, and North Central Hills. The 10th physiographic region is the Yazoo Basin, which is part of the Mississippi Alluvial Plain.

Eight of the 12 soil orders (broad soil groups) recognized in the United States are found in Mississippi, which has great soil diversity (Pettry 2004). Soils in Mississippi are largely correlated with the State's topographic regions; due in part, to effects that parent material and relief have on the soil formation process.

From an agricultural perspective, the two most productive soil areas of Mississippi are the Mississippi Delta (the Yazoo Basin physiographic region) and the Blackland Prairies (the Jackson Prairie and Blackbelt Prairie physiographic regions). Appendix F briefly describes the major parent soil units and their locations.

The characteristics of soils in BLM-administered non-USFS FMO areas are described in Appendix F.

Prime and Unique Farmlands

The Farmland Protection Policy Act requires the identification of proposed actions that would affect any lands classified as prime and unique farmlands. NRCS administers this act to preserve farmland.

Prime farmland is defined as having the availability and best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Its soil quality, growing season, and moisture supply can produce economically sustained high yields of crops when treated and managed according to acceptable farming methods, including water management. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. The land is permeable to water and air. Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they neither flood nor require protection from flooding.

Prime farmlands occur throughout most of Mississippi. Counties in Mississippi with oil and gas development likely include soil units that have been identified as prime farmland by NRCS. Appendix F includes prime farmland classification information that is available for soils within non-USFS FMO.

3.4.3 Water Resources

Surface Water

The surface waters of the State of Mississippi are divided into 10 major drainage areas or river basins—the Big Black River Basin, Coastal Streams Basin, Mississippi River Basin, North Independent Streams Basin, Pascagoula River Basin, Pearl River Basin, South Independent Streams Basin, Tennessee River Basin, Tombigbee River Basin, and Yazoo River Basin (Map 3-4). Appendix H briefly describes each of these major river basins.

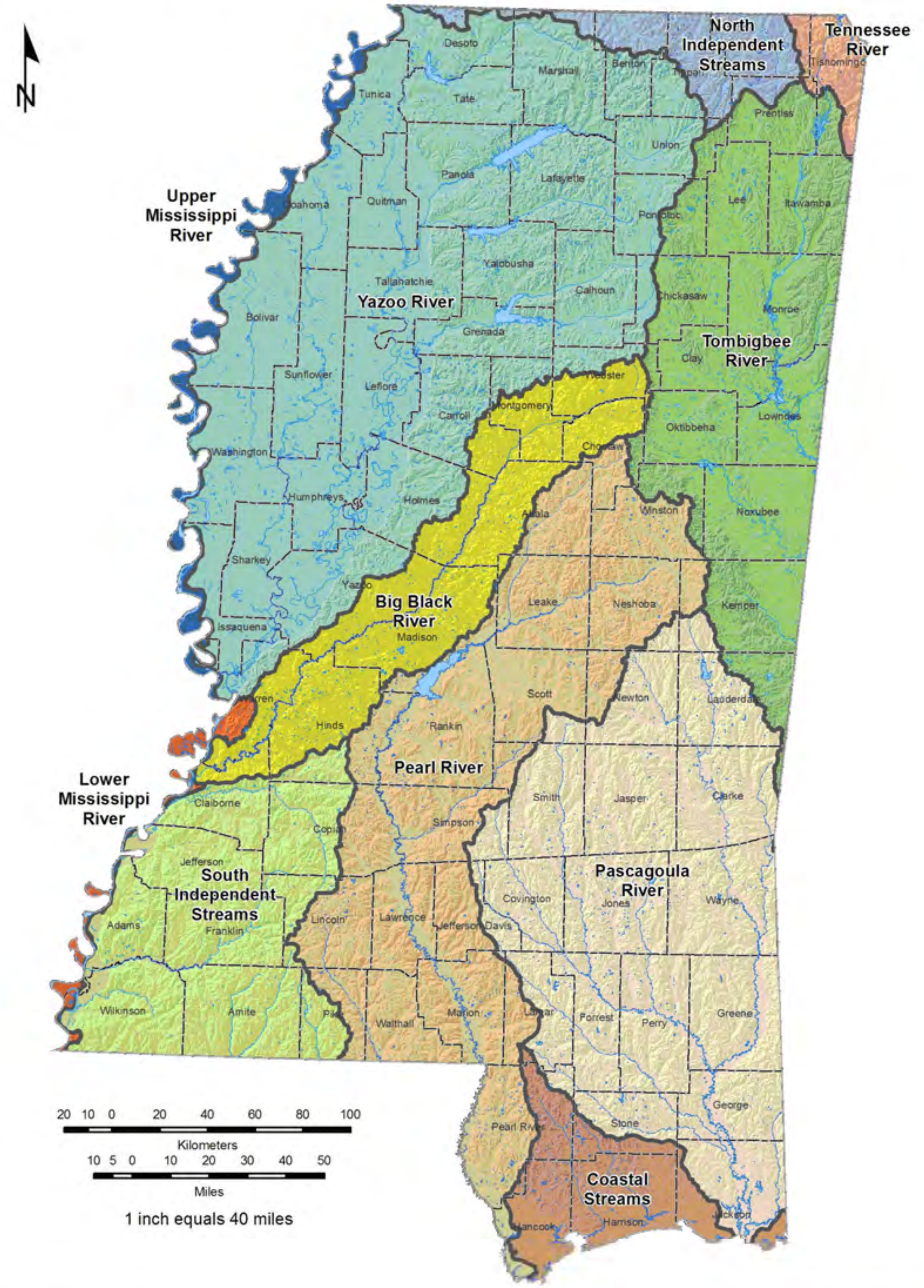
Wetlands occupy an estimated 4 million acres in Mississippi. Since the 1800s, almost 6 million acres of wetlands (including 10,000 acres of coastal wetlands) have been lost. Historically, loss was mainly the result of converting wetlands to agricultural lands. Today, wetland loss is primarily associated with residential and commercial development (MDEQ 2005).

The surface water quality of most of Mississippi’s approximately 84,000 miles of rivers fully or partially supports designated uses. The major cause of impaired water quality is nonpoint agricultural runoff. Minor causes are industrial and municipal point-source discharges and runoff from nonagricultural nonpoint sources (USGS 2003b).

About 47 river miles are within BLM-administered non-USFS FMO areas in Mississippi. Oil and gas leases exist on about 0.6 river mile. About 32,000 lake acres occur within non-USFS FMO areas. NWI data are limited for Mississippi. Because available digital data for freshwater wetlands in Mississippi is lacking, the non-USFS FMO acreage in freshwater wetland areas in Mississippi could not be estimated.

Map 3-4: Major Drainage Basins of Mississippi

Alabama-Mississippi RMP-EIS



- Major Rivers
- Waterbodies
- Drainage Basins
- County Boundary

Projection: UTM, Zone 16 North
Datum: North American Datum of 1983 (NAD83)

Sources: BLM, Jackson Field Office
Environmental Systems Reasearch Institute
MARIS - Mississippi Automated Resource Information System
Mississippi Department of Water Quality
USGS - National Elevation Data

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

Ground Water

Mississippi has 15 major aquifers that provide 80 percent of its public water supply for domestic and commercial, industrial, mining, thermoelectric power, and agricultural users (USGS 1998). Only two municipalities, Jackson and Tupelo, receive some public water from surface water sources. Mississippi has an abundant supply of ground water, which at some locations occurs at depths exceeding 3,000 feet (USGS 1998).

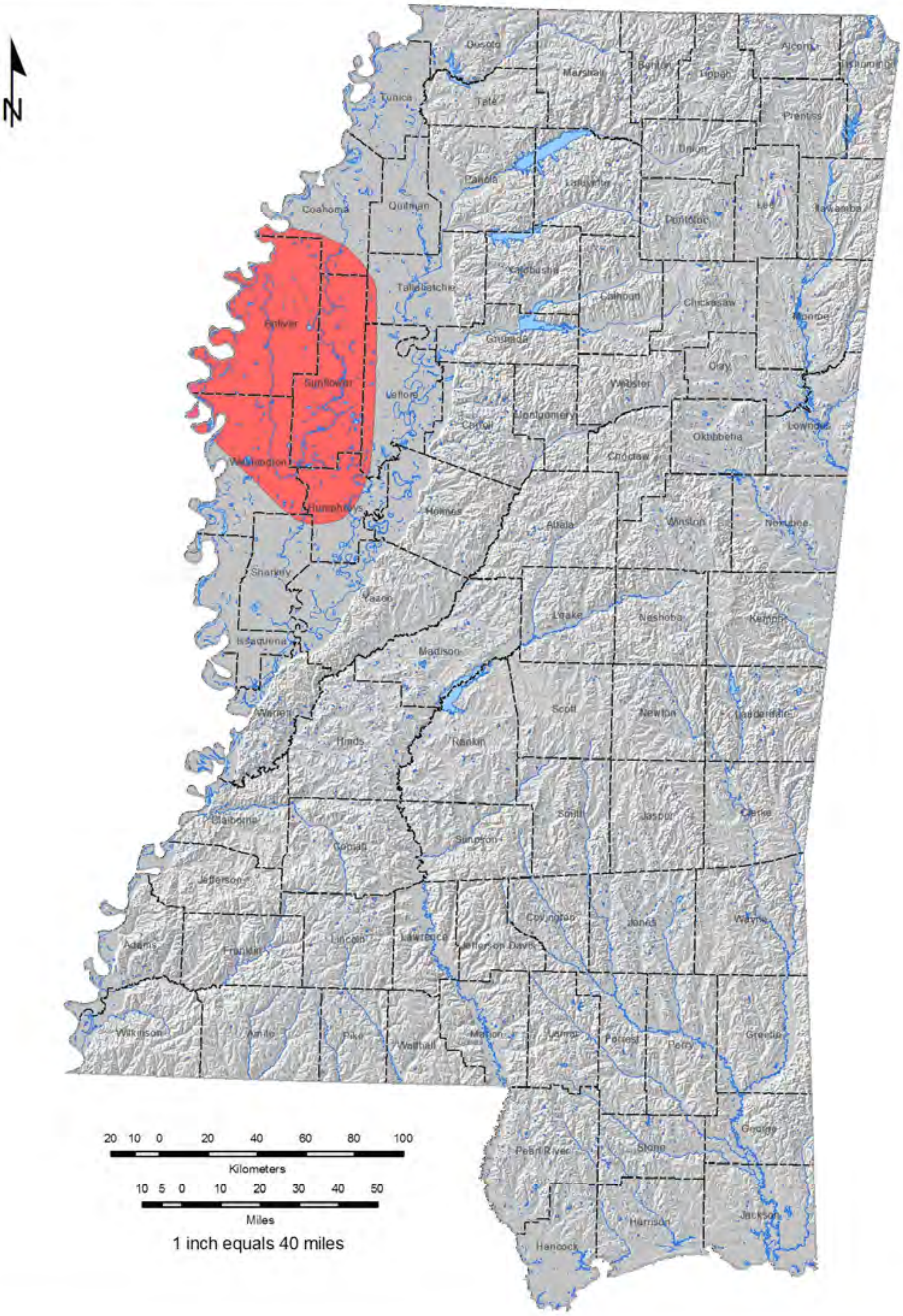
Ground water withdrawals are concentrated in the urbanized and industrialized areas of Mississippi and in the Mississippi River Alluvial Plain in northwestern Mississippi, where large withdrawals are made for crop irrigation and catfish production. These withdrawals have resulted in significant, long-term declines in water levels in some areas. Declining ground water levels and the ability of the aquifers to meet the increasing demand for water continue to be an important water resources concern in the State. For example, in central Mississippi, Cockfield and Sparta are two major aquifers. Water levels in the Cockfield Formation have slightly decreased at selected sites, whereas levels in a few wells near pumping centers have decreased by 1 to 4 feet. Some wells screened in the Sparta Sand indicated declines of 2 to 6 feet (USGS 2003b).

Precipitation is the ultimate source of water that recharges the major aquifers in Mississippi. Studies show that less than 50 percent of the annual precipitation ends up in stream runoff. Only a small amount of water recharges aquifers that are either exposed or buried to shallow depths, and an even smaller amount percolates downward and enters the deep-flow system (USGS 1998).

Map 3-5 presents the areas that are primary ground water recharge zones in Mississippi. On the basis of a rough geospatial analysis, 4,470 acres of non-USFS FMO occur in primary ground water recharge zones (defined as recharge greater than 3 inches per year).

Map 3-5: Primary Groundwater Recharge Zones in Mississippi

Alabama-Mississippi RMP-EIS



〰 Major Rivers

🟥 Zone where groundwater recharge is greater than 3 inches per year.

● Waterbodies

⬚ County Boundary

Projection: UTM, Zone 16 North
Datum: North American Datum of 1983 (NAD83)

Sources: BLM, Jackson Field Office
Environmental Systems Reasearch Institute
MARIS - Mississippi Automated Resource Information System
Mississippi Department of Water Quality
USGS - National Elevation Data

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Coastal Zone

The National CZM Program is a voluntary partnership between the Federal government and U. S. coastal states and territories authorized by the Coastal Zone Management Act of 1972. The Coastal Programs Division, within NOAA's Office of Ocean and Coastal Resource Management, administers the program at the Federal level and works with State CZM partners. Mississippi CZM Program (MSCZMP) focuses primarily upon coastal wetlands below the watermark of the ordinary high tide and adjacent wetlands. The Hancock County tracts, in addition to BLM-administered non-USFS FMO, fall within the MSCZMP.

The Mississippi Gulf Coast encompasses 370 miles of shoreline and nearly 56,000 acres of emergent wetlands. The coastal wetlands habitat of Mississippi is among the most ecologically diverse systems in the country. This system provides for ecological functions such as pollution filtering, sediment trapping, and flood control and is an important nursery area that increases the productivity of an abundant fishery resource. These ecological functions also provide economic benefits through commercial and recreational fisheries, hunting, trapping, and many other forms of recreation and commerce (MPA 2005). The Mississippi Department of Marine Resources (DMR) is preparing a Comprehensive Resource Management Plan (CRMP) that will include management and protection applications for coastal wetlands and marine resources in the six coastal counties of Mississippi (including Hancock County, where a BLM surface tract is located) by coordinating agency efforts, developing the necessary partnerships among public and private entities, and integrating wetlands protection and management into the lifestyle of the coastal community. The Mississippi CRMP was unavailable for reference in this plan.

On the basis of the rough geospatial analysis, about 32,440 acres of BLM-administered non-USFS FMO are within Mississippi coastal wetlands. However, about 24,000 of these acres are within 10 miles of the Stennis Space Center, one of NASA's primary centers for rocket propulsion testing, and are not likely to be developed. Of about 8,380 acres of non-USFS FMO in wetlands, 990 acres are in high-potential areas for future mineral development.

3.4.4 Vegetative Communities

For this planning effort, GAP was used to delineate land cover types on non-USFS FMO in Mississippi. This land cover map is based on Landsat-7 satellite imagery using the NLCD, which includes 21 very broad land cover classifications. The decision to use this data set was based on its statewide application and availability in a geographical information system format at the time this planning effort was initiated. Analysis of the GAP land cover map resulted in the identification of eight dominant cover types on non-USFS FMO lands in Mississippi. The dominant vegetation cover types on non-USFS FMO within Mississippi include evergreen forest/woodland (23 percent); wetland forest/shrubland (14 percent); deciduous forest/woodland (11 percent); row/crops (10 percent); grassland/herbaceous (9 percent); open water (9 percent); pasture/hay (6 percent); and mixed forest/woodland (4 percent). Several less dominant communities (14 percent) are not discussed herein. A brief description of each community follows.

- **Evergreen Forests/Woodlands (23 percent)—**This classification delineates areas where 75 percent or more of the tree species are evergreen. In Mississippi, the dominant pine species are loblolly, longleaf, slash, and shortleaf. This classification includes commercial pine plantations, where loblolly is the most commonly planted pine species. An additional species, sand pine, dominates a narrow band of scrub habitats behind the coastal dune systems along the Gulf of Mexico.
- **Wetland Forest/Shrubland (14 percent)—**This classification is dominated by bottomland hardwood vegetation that is periodically inundated by water and encompasses diverse communities ranging from forested swamps and bogs to coastal marshes. Common vegetation in

seasonally flooded forests are sweet bay, southern magnolia, sweetgum, wax myrtle, various oaks, and titi. Typical wetland or bog species include pitcher plants, various rushes, sedges, arrowhead, and St. John's wort. Typical species of coastal marshes include sawgrass, needlerush, and bulrush

- **Deciduous Forests/Woodlands (11 percent)—** This classification is dominated by trees of which 75 percent or more are hardwoods. Common trees in these areas include a wide variety of oak and hickory species, maple, ash, hackberry, yellow poplar, beech, elm, sweetgum, persimmon, and cherry.
- **Row/Crops (10 percent)—**This classification includes areas being actively cultivated.
- **Grassland/Herbaceous (9 percent)—**Grassland/herbaceous communities are composed of dry systems dominated by low herbaceous vegetation and are absent of woodlands.
- **Open Water (9 percent)—**This classification denotes water and does not support terrestrial vegetation species.
- **Pasture/Hay (6 percent)—**Vegetation in this community is largely composed of introduced grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of hay crops.
- **Mixed Forests/Woodlands (4 percent)—**This classification delineates areas where neither hardwood nor pine species represent more than 75 percent of the cover. These mixed hardwood/pine areas are typically dominated by loblolly, shortleaf, slash, and/or longleaf pine, with a wide variety of oak and hickory species, plus hackberry, elm, sweetgum, persimmon, and yellow poplar.

Mississippi Invasive/Exotic Species

The Mississippi Exotic Pest Plant Council lists the top ten worst invasive plants as tallowtree (*Triadica sebifera*); Chinese privet (*Ligustrum sinense*); Japanese honeysuckle (*Lonicera japonica*); tropical soda apple (*Solanum viarum*); purple loosestrife (*Lythrum salicaria*); kudzu (*Pueraria montana var. lobata*); cogongrass (*Imperata cylindrica*); Johnson grass (*Sorghum halepense*); water hyacinth (*Eichornia crassipes*); alligator weed (*Alternanthera philoxeroides*); and Eurasian milfoil (*Myriophyllum spictum*). To date, Chinese tallow, Chinese privet, Japanese honeysuckle, kudzu, and cogon grass have been the most frequent exotic species occurring on BLM non-USFS FMO. Cogon grass, in particular, has the potential to affect future land use practices because of its ability to alter natural fire regimes, its thick growth habit that excludes other vegetation, and the difficulty to control it. Chinese privet is a common invasive along edges and disturbed sites throughout the State. Chinese tallow tree is often found near wetlands and disturbed areas including fence rows and roads.

3.4.5 Fish and Wildlife

Game Species

Mississippi has abundant and diverse game populations actively managed across the State. The State supports the highest white-tailed deer density in the nation with the population estimated at 1.75 million. The wild turkey population is estimated at 300,000. Both species were brought back by extensive restocking efforts during the 1950s and 1960s. Mourning dove is common throughout farms, woodlots, agricultural fields, and grasslands. Small game species include rabbit, gray squirrel, and fox squirrel. Naturalized populations of wild hog are now found in at least 65 of Mississippi's 82 counties. Mississippi is part of the Mississippi Flyway; reservoirs, ponds and swamps across the State provide important winter habitat for waterfowl that are produced in the Prairie Pothole Region and Great Lakes States. In most years, Mississippi winters significant numbers of mallards and wood ducks across the State. Historically, flooded forests in the Delta region of northwestern Mississippi provided reliable, high-quality habitat for millions of mallards, wood ducks, and other waterfowl. This region is the focus of major waterfowl conservation efforts, including the Lower Mississippi Joint Venture program.

Neotropical Migratory Birds

According to the Mississippi Ornithological Society, 396 bird species have been seen in Mississippi. The State is an important migration route for many migratory songbirds. The Mississippi Gulf Coast is a key staging area for migrants as they replenish fat reserves for the trans-Gulf flight during the fall and provides the first landfall for tired migrants during spring migrations.

3.4.6 Special Status Species

For the purposes of this document special status species are defined as all Federal and State-listed, species occurring in the State, species proposed or candidates for Federal or State listing, and those species identified by BLM as sensitive species. BLM Eastern State’s policy designates as “BLM sensitive” those additional species that are considered to be critically imperiled (S-1) or imperiled (S-2) by the State Natural Heritage programs. The USFWS lists 37 Federally-listed species which currently or historically occurred in Mississippi. The Mississippi Natural Heritage Program (MNHP) inventory lists 339 species ranked as either critically imperiled (S-1) or imperiled (S-2) in the State. A list of S-1 and S-2 species being tracked by MNHP is included in Appendix E. A complete list of the wildlife species of conservation concern in the State is available in the Mississippi CWCS.

This discussion of special status species takes a statewide perspective, even though management of BLM’s scattered surface acreage and oil and gas development would probably directly affect less than 229 acres in total. Oil and gas leasing of non-USFS FMO in particular could occur anywhere in the State, and future oil and gas development has the potential to affect aquatic systems downstream from locations substantially increasing the area potentially affected. Therefore, a statewide perspective is needed to cover the full geographic range of potential impacts.

Overview

The State of Mississippi covers four ecoregions: the East Gulf Coastal Plain, the Upper East Gulf Coastal Plain, the Mississippi Alluvial Plain, and the Northern Gulf Coastal Plain (see Section 3.4.2). The following discussions highlight the special status issues in each of these ecoregions.

The **East Gulf Coastal Plain** is one of the most biologically rich ecoregions in the country. Many of the special status species in this area are associated with the vast longleaf pine forests and embedded wetland bogs that once stretched across much of the southern United States. Longleaf forests are now found on about three percent of the original acreage, much of it converted to commercial pine plantations for loblolly and slash pine. What acreage remains is often degraded by exclusion from the frequent fires that historically maintained this system and by habitat fragmentation. Species endemic to the ecoregion, many of which were never common, have been further imperiled by these changes (Mississippi CWCS). Keystone species in this habitat are the red-cockaded woodpecker and gopher tortoise, both Federally and State-listed. Others include the highly restricted Mississippi gopher frog found only in a handful of ponds in Harrison and Jackson counties.

Wet savannas in the East Gulf Coastal Plain are estimated to be reduced to less than five percent of their original acreage (Mississippi CWCS). Most of the largest patches of this habitat are located in the Sandhill Crane NWR. This region's pitcher bogs and pine seeps support an exceptionally diverse flora and endemic crawfish species, including one Federally-listed crayfish and six other crayfish listed as imperiled or critically imperiled.

Two large and biologically important rivers systems flow through this portion of the East Gulf Coastal Plain: the Pearl River and the Pascagoula River. Both are considered vulnerable (Mississippi CWCS). The lower Pearl River is affected by impoundment at the Ross Barnett Reservoir, as well as channelization and increased sediments from surrounding land uses. The Pascagoula is America's longest unencumbered river and one of the most intact in the southeast (Mississippi CWCS). These river systems support 13 Federally or State-listed species, and 19 other special status species, mostly fish and mussels. The rivers and major tributaries are designated critical habitat for Gulf sturgeon.

The **Mississippi River Alluvial Plain** bordered by the Mississippi River on the west is dominated by bottomland hardwood forests. These rich frequently flooded forests and associated habitats support over 240 fish species, 45 species of reptiles and amphibians, and 37 species of mussels. In addition, 50 species of mammals and approximately 60 percent of all bird species in the contiguous United States currently utilize this ecoregion (Mississippi CWCS). This area is important to the recovery of the endangered Louisiana black bear, and recently supported one of the two litters recorded in the State in over 30 years. Old-growth hardwoods are crucial habitat for 11 of 18 bat species in the southeast (Mississippi CWCS). At least four Federally-listed species and seven other special status species occur in this area.

The **Upper East Gulf Coastal Plain** in Mississippi ranges from the northern edge of the longleaf pine forests grading to the north through oak-hickory-pine forests to oak-hickory forests. Many of the most vulnerable special status species occurring in this area are associated with the river systems, wetland habitats and prairie opening scattered through Jackson and larger Black Belts. This region supports a large number of endemic crayfish, mussel species, and fish. Key rivers include the Tombigbee, Yazoo, and Big Black Rivers, all of which have been substantially altered by impoundments and channelization. Tributaries and streams in this area have been subjected to increased sedimentation from agricultural and forestry. The Mississippi CWCS lists 45 crayfish, fish and mussel special status species as critically imperiled (S-1) or imperiled (S-2) in the Tombigbee River system, this in addition to thirteen Federally-listed species. Six of these mussel species in Tombigbee are presumed or expected to be extirpated from the State. Karst areas in Mississippi are primarily associated with the "Vicksburg Group" of soils in Clark, Jasper, and Wayne counties in east central Mississippi, and Union and Tishomingo counties. About 65 caves covering less than 100 acres support several special status species, including cave salamander, spring salamander, and many of the State's bat species.

The **Mississippi Northern Gulf Coastal Plain** includes barrier islands with beaches, coastal marshes, and maritime scrub and woodlands. At the coastline, these habitats grade through salt marshes to productive estuaries (Mississippi CWCS). Mississippi has established an 83,000-acre coastal preserve system to protect and enhance coastal wetlands and barrier islands. The system is dominated by coastal wetlands that support a number of special status shorebirds, including the piping plover, American oystercatcher, and Wilson's plover; wading birds, such as reddish egret and white ibis; and others such as the brown pelican. They also support the Mississippi diamondback terrapin. Natural beaches in the State tend to be mud shores often associated with the estuaries of larger rivers and provide important foraging areas for wading birds and shorebirds. Maritime woodlands dominated by live oak, laurel oak, and saw palmetto provide crucial staging areas for neotropical migrants to rest and build or replenish fat reserves, particularly during inclement weather and for exhausted birds making landfall. This habitat is considered critically imperiled due to its extreme rarity and because of the threats of urbanization and exotic weeds.

Species Accounts

The following Federally-listed or candidate species are known to occur or to have potential to occur on BLM non-USFS FMO (Natureserve 2006). A list of species ranked by MNHP as critically imperiled (S-1) or imperiled (S-2) is provided in Appendix E.

Mammals

Louisiana black bear (Ursus americanus luteolus), Federally-listed as endangered, State-listed as endangered

The Louisiana black bear prefers forested areas with dense understory vegetation, particularly bottomland hardwoods which include hard and soft mast, escape cover, denning sites, corridor habitat, and distance from humans. Escape cover is especially critical for bears that live in fragmented habitat and close to humans. Access to a variety of habitat is consistent with the black bear's need for a seasonal assortment of foods during the year. Louisiana black bears have been known to travel long distances in search of food, habitat, and mates. Modification and loss of habitat are the primary reasons for the decline of the black bear (USFWS 1995). There are an estimated 50 Louisiana black bears in Mississippi. Recent litters in Washington County and in the Mississippi Delta are the first recorded in 30 years.

Gray myotis (Myotis grisescens), Federally-listed as endangered, State-listed as endangered

Gray myotis roost almost exclusively in caves, generally utilizing different caves for summer and winter hibernaculum. Gray bats were last documented in Mississippi in 1967 in the northeastern corner of Tishomingo County. A male was found on private property in Tishomingo County on September 20, 2004. The location is approximately 90 km southwest of the closest known gray bat maternal colony, located at Blowing Springs Cave, Alabama (Sherman and Martin 2006).

Indiana bat (Myotis sodalis), Federally-listed as endangered, State-listed as endangered

Indiana bat hibernates in caves, typically limestone with pools where the mean midwinter temperature is 4 – 8 degrees Celsius. During the summer, their habitat consists of wooded or semiwooded areas, often but not always along streams. Indiana bats roost in hollow trees or under loose bark during the summer, including the season for rearing their young. Foraging habitats include riparian areas, upland forests, ponds, and fields (Menzel et al. 2001). There are no known hibernacula in Mississippi, but there is potential for this species to occur in Tishomingo County, utilizing summer habitats.

Birds

Southeastern snowy plover (Charadrius alexandrinus tenuirostris), State-listed as endangered

This species occurs year round on the coastal beaches, dry mud or salt flats, sandy shores of rivers, lakes, and ponds. The species nest on ground on broad open beaches or salt or dry mud flats, where vegetation is sparse or absent (small clumps of vegetation are used for cover by chicks); nests are found beside or under objects or in the open.

Interior least tern (Sterna antillarum athalassos), Federally and State-listed as endangered

This population is Federally-listed where it occurs along sand bars and beaches along the Mississippi River.

Mississippi sandhill crane (Grus canadensis pulla), Federally-listed as endangered, State-listed as endangered

This non-migrating subspecies is currently restricted to an area in southern Jackson County, Mississippi, extending from the Pascagoula River west to the Jackson County line, south to Simmons Bayou, north latitude about four miles north of Vancleave; part of this area is within the Mississippi Sandhill Crane NWR. Typical habitat is open savannas, swamp edges, young pine plantations, and wetlands along edges of pine forests; associated trees and shrubs include longleaf pine, slash pine, bald cypress, gallberry, wax myrtle, black gum, sweet bay, and yaupon.

Bewick's wren (Thryomanes bewickii), State-listed as endangered

An extremely rare bird east of the Mississippi River, Bewick's wrens are seen occasionally in Mississippi during the winter, rarely breeding in the State.

Piping plover (Charadrius alexandrinus), Atlantic Coast and Great Plains populations listed as Federally-threatened and Great Lakes populations listed as Federally-endangered, State-listed as endangered

All three populations of piping plover winter along the south Atlantic and Gulf coasts where they are classified as threatened. On July 3, 2001, USFWS designated 165,211 acres along 1,798 miles of coastline in eight southern States as critical habitat for the wintering population of piping plover. This includes much of the Mississippi coastline. Wintering birds are present from August to May, but numbers peak during the winter months.

Bald eagle (Haliaeetus leucocephalus), Federally-listed as threatened, proposed for delisting, State-listed as endangered

Bald eagles are found throughout the State primarily along larger rivers and numerous reservoirs. In 2006, there were 31 active nests in the State being monitored with up to 62 chicks, and the possibility of 13 additional nests (Nick Winstead, personal communication).

Wood stork (Mycteria americana), Federally-listed as endangered, State-listed as endangered

The wetlands of the Coastal Plain of Mississippi provide important foraging habitat for wood storks that disperse from breeding areas in Florida, Georgia, and South Carolina in late summer and early fall. Primarily habitats are marshes, swamps, lagoons, ponds, and flooded fields and ditches. During extended drought, depressions in marshes and brackish wetlands have increased importance. In Mississippi, wood storks occur primarily in the coastal counties, including Hancock, Jackson, and Harrison Counties.

Brown pelican (Pelecanus occidentalis), Federally-listed as endangered, although under status review for delisting (Federal Register, May 24, 2006), State-listed as endangered

The brown pelican is a coastal species that makes extensive use of sand spits, offshore sand bars, and islets for nocturnal roosting and daily loafing, especially by nonbreeders and during the non-nesting season. Dry roosting sites are essential. Some roosting sites eventually may become nesting areas.

Red-cockaded woodpecker (Picoides borealis), Federally-listed as endangered, State-listed as endangered

Red-cockaded woodpeckers require open pine woodlands and savannahs with large old pines for nesting and roosting habitat. Large old pines are required as cavity trees and are typically in open stands with little or no hardwood midstory and few or no overstory hardwoods. Hardwood encroachment resulting from fire suppression is a well-known cause of cluster abandonment. Suitable foraging habitat typically consists of mature pines with an open canopy, low densities of small pines, little or no hardwood or pine midstory, few or no overstory hardwoods, and abundant native bunchgrass, and forb groundcovers. The Federal threshold for minimally suitable foraging habitat is stands of at least 50 percent pine where the dominant trees are pines over 30 years of age. Minimum criteria for nesting habitat is pines, 60 years or older, which may be dispersed among younger stands, located within 0.5 miles of suitable foraging habitat.

Reptiles

Black pine snake (Pituophis melanoleucus lodingi), a Federal candidate for listing, State-listed as endangered

Black pine snake habitat is characterized as sandy, well-drained soils with an overstory of longleaf pine, a fire-suppressed mid-story, and dense herbaceous ground cover. In Mississippi, there are recent records in nine out of 14 counties with historic records (Forrest, George, Harrison, Jones, Marion, Pearl River, Perry, Stone, and Wayne). The distribution of populations within these counties has become highly restricted due to the fragmentation of the remaining longleaf pine habitat. In seven of the nine occupied Mississippi counties, populations of black pine snakes are concentrated in the DeSoto National Forest. In the remaining occupied Mississippi counties, one population is known from the Marion County Wildlife Management Area and one occurs on private land.

Loggerhead sea turtle (Caretta caretta), Federally-listed as threatened and State-listed as endangered

The most common nesting sea turtle in Mississippi, loggerheads nest on open sandy beaches above high-tide mark, seaward of well-developed dunes primarily on barrier islands. Nesting normally occurs from early May through August, with the majority of nests being laid during June and July. Females lay three to five nests, and sometimes more, during a single nesting season. The eggs incubate approximately two months before hatching sometime between late June and mid-November.

Rainbow snake (Farancia erytrogramma) State-listed as endangered

This snake lives primarily in or near rivers, creeks, swamps, springs, and open marshes, including brackish tidal areas; in some areas hibernation occurs in uplands near water. In Mississippi there are records for this snake in Forrest, Hancock, Jackson, and Lamar Counties.

Gopher tortoise (Gopherus polyphemus), Federally-listed as threatened, State-listed as endangered

In Mississippi, gopher tortoise populations are restricted to the well-drained sandy soil that once supported the vast longleaf forests across the State and much of the southeast. These habitats limit the tortoise's range in Mississippi to the lower 14 counties of the State. Research has shown that gopher tortoises move up to 600 feet between burrows for breeding purposes and two or more burrows within 600 feet of each other can be defined as a population (McDearman, personal communication)

Yellow-blotched map turtle (Graptemys flavimaculata), Federally-listed as threatened, State-listed as endangered

The yellow-blotched map turtle is found only in the Pascagoula River system, including its tributaries: the Leaf, Chickasawhay, and Escatawpa Rivers in southern Mississippi.

Black-knobbed map turtle (Graptemys nigrinoda), State-listed as endangered

Black-knobbed map turtle habitat consists of rivers and streams with moderate current, sand or clay bottom, and logs and other basking sites in northeastern Mississippi in Clay, Lowndes, and Monroe Counties.

Ringed map turtle (Graptemys oculifera), Federally-listed as threatened, State-listed as endangered

Typical habitat is medium size streams and rivers with moderate to fast current, numerous basking logs, nearby sand and gravel bars, and channel wide enough to allow sun to reach basking logs from 10:00 a.m. to 4:00 p.m. (McCoy and Vogt 1980, Dickerson and Reine 1996). This species requires high water quality to support main food sources. Eggs are laid in nests dug in sandy beaches or gravel bars. In Mississippi, the ringed map turtle is found in the Pearl River system from the vicinity of Philadelphia, Neshoba County, downstream in the Pearl (including Ross Barnett Reservoir) and West Pearl rivers to near the town of Pearl River. Distribution includes habitats in Copiah, Hinds, Lawrence, Leake, Madison, Marion, Neshoba, Pearl River, Rankin, Scott, and Simpson Counties.

Green sea turtle (Chelonia mydas), Federally-listed at threatened, State-listed as endangered

The green sea turtle may be an occasional visitor to Mississippi waters, but is not known to nest in the State.

Kemp's Ridley sea turtle (Lepidochelys kempii), Federally-listed at endangered, State-listed as endangered

Kemp's Ridley sea turtle is an occasional visitor to Mississippi waters, where it is sometimes caught in shrimp nets. Almost the entire population nests in Mexico and southern Texas.

Leatherback sea turtle (Dermochelys coriacea), Federally-listed at endangered, State-listed as endangered

The leatherback sea turtle is an occasional visitor to Mississippi waters, but not known to nest in the State.

Eastern indigo snake (Drymarchon couperi), Federally-listed as threatened, State-listed as endangered

The historical range of the eastern indigo snake was from the east coast of South Carolina through southern Georgia, Florida, into south Alabama and southwest Mississippi, often associated with gopher tortoises. Particularly outside of southern Florida, gopher tortoise burrows provide important refugia from temperature extremes. Naturally occurring populations are now found only in southern Georgia and Florida. Indigo snakes were historically found in the lower coastal plain along with the burrowing gopher tortoise. This species is very rare and possibly extirpated in Mississippi.

Hawksbill sea turtle (Eretmochelys imbricata), Federally-listed as endangered, State-listed as endangered

Hawksbill sea turtles may be an occasional visitor to Mississippi waters, but are not known to nest in the State.

Southern hognose snake (Heterodon simus), State-listed as endangered

Historically this snake occurred in open, xeric habitats with well-drained, sandy soils in the Coastal Plain from eastern North Carolina to southern Florida, west to southeastern Mississippi. It is now presumed to be extirpated in Mississippi and possibly extirpated in Alabama.

Amphibians

One toed amphiuma (Amphiuma pholeter), State-listed as endangered

This species is found in deep, organic, liquid muck in alluvial swamps of low-gradient 2nd or 3rd order streams, spring runs, and occasionally floodplain swampy terrace streams. There are records from Jackson County in Mississippi.

Mississippi gopher frog (Rana sevosa), Federally-listed as endangered, State-listed as endangered

This species once existed in the longleaf pine forests of the lower coastal plain from east of the Mississippi River in Louisiana to the Mobile River delta in Alabama. It has not been seen in Louisiana since 1967 or in Alabama since 1922. It is currently known to exist in three limited locations. The largest and best known population is at Glen's Pond located in Harrison County, Mississippi on the De Soto National Forest. Two other occupied ponds were found in 2004; one pond is owned by the State of Mississippi and the other on private land in Jackson County.

Green salamander (Aneides aeneus), State-listed as endangered

This salamander is limited to northeastern Mississippi with records from Tishomingo County. It prefers damp (but not wet) crevices in shaded rock outcrops and ledges. It sometimes reaches high population densities in logged areas where tree tops are left.

Cave salamander (Eurycea lucifuga), State-listed as endangered

This salamander is found in caves (usually limestone); also rocky streams and springs, and wooded areas and fields, usually near caves or limestone outcrops in northern Mississippi. There are records from Tishomingo County.

Spring salamander (Gyrinophilus porphyriticus) State-listed as endangered

This salamander is found in small, clear upland streams; clear springs; caves; shaded seepages; occasionally in swamps and lake margins, sometimes also in forested wet areas away from streams, especially during rainy periods. There are records of this salamander from Tishomingo County.

Fish

Gulf sturgeon (Acipenser oxyrinchus desotoi), Federally-listed as threatened, State-listed as endangered

Adult Gulf sturgeon migrate into large river systems between late March and early April to spawn, sometimes moving as much as 140 miles upstream. Adults and subadults return to the Gulf of Mexico in late fall. The young generally stay in the river mouth through winter and spring. Critical habitat has been designated and in Mississippi includes the Pearl and Pascagoula Rivers and their major tributaries.

Pallid sturgeon (Scaphirhynchus albus), Federally-listed as endangered, State-listed as endangered

The pallid sturgeon is a species of large, turbid, free-flowing rivers; occurs in strong current over firm gravel or sandy substrate. In Mississippi, records are from the Mississippi River and Sunflower River/Yazoo Rivers.

Alabama sturgeon (Scaphirhynchus suttkusi), Federally-listed as endangered, State-listed as endangered

The Alabama sturgeon was found historically throughout the Mobile River basin in Mississippi and Alabama. It is now restricted to a 216 km (130 mi) reach of the Alabama River in Alabama.

Crystal darter (Crystallaria asprella), State-listed as endangered

The crystal darter is found in large creeks and rivers with extensive clean sand and gravel raceways. In Mississippi, crystal darters may be extirpated from the Tombigbee River, as they have not been collected since shortly after it was completed. There are other records from Pearl River system and Bayou Pierre.

Bayou darter (Etheostoma rubrum), Federally-listed as threatened, State-listed as endangered

The bayou darter distribution is very localized and found in Bayou Pierre and its tributaries in Copiah County. The largest concentrations occur in sections of Bayou Pierre and Foster Creek, north of State Highway 548. Bayou darter prefers stable, moderately swift riffles of large gravel and rock in creeks and small to medium rivers.

Ironcolor shiner (Notropis chalybaeus), State-listed as endangered

This shiner occurs in low gradient coastal streams along the Atlantic and Gulf coasts. In Mississippi, surveys in 1995 – 1996 did not find any ironcolor shiners at 15 historic locations. During this survey, a new locality was recorded in extreme southeastern Mississippi in the Escatawapa River (Albanese and Slack 1998).

Frecklebelly madtom (Noturus munitus), State-listed as endangered

This fish occurs chiefly in rocky riffles in medium to large rivers. In Mississippi the current range is restricted to the Tombigbee and Pearl River systems.

Greenside darter (Etheostoma blennioides), State-listed as endangered

Habitat preferences are variable; often in medium-sized to large creeks and small to medium rivers with gravel- or rubble-strewn riffles, although they also occur in silt-free, shallow bedrock pools with steady current, and sometimes inhabit relatively quiet lake shores. In Mississippi, records are from the northeastern corner of the State in Tishomingo County.

Saltmarsh topminnow (Fundulus jenkinsi) Federal candidate for listing

This coastal species is found in cord grass marshes. During a recent survey, 90 percent of the saltmarsh topminnow were found in water with ≤ 12% salinity. In Mississippi, there are scattered records along the coast, including the Simmons Bay, Old Fort Bayou, Biloxi Bay, and Bay St. Louis.

Bigeye shiner (Notropis boops), State-listed as endangered

This fish is generally confined to upland streams in the Mississippi River basin from the Tennessee and Ohio River basins west to Missouri and Arkansas. In Mississippi, there are records from the Tennessee River system in the northeastern portion of the State.

Slenderhead darter (Percina phoxocephala), State-listed as endangered

This species is found in runs and riffles of creeks and small to medium rivers with moderate to strong flow and gravel, rubble, or bedrock substrate. In Mississippi, records are from Tishomingo County in the northeast corner of the State.

Suckermouth minnow (Phenacobius mirabilis) State-listed as endangered

This bottom-feeding minnow is found in low-gradient and moderate-gradient rivers and large creeks. In Mississippi, there are records in Tishomingo County.

Southern redbelly dace (Phoxinus erythrogaster) State-listed as endangered

This dace is generally found in headwater streams and upland creeks. In Mississippi, there are records from Tallahatchie, Tishomingo, Warren, Wilkinson, and Yazoo Counties.

Slender madtom (Noturus exilis) State-listed as endangered

This species uses a wide range of depths and current velocities. In Mississippi, there are records from Tishomingo County.

Mussels

The following mussel species are Federally or State-listed in Mississippi.

Table 3-13. Federally and State-listed Mussel Species in Mississippi

Federally and State-listed Mussel Species in Mississippi	Federal Status	State Status	County Occurrence Records
Alabama moccasinshell (*Medionidus acutissimus*)	T	E	Lowndes and Monroe Counties
Black clubshell (*Pleurobema curtum*)	E	E	Monroe County
Delicate spike (*Elliptio arctata*)		E	George, Leake, Lowndes, Monroe and Simpson Counties
Fat pocketbook (*Potamilus (=Proptera) caprax*)	E	E	Adams, Issaquena and Jefferson Counties
Flat pigtoe (*Pleurobema marshalli*)	E	E	Lowndes County
Heavy pigtoe (*Pleurobema taitianum*)	E	E	Lowndes and Itawamba Counties
Inflated heelsplitter (*Potamilus inflatus*) **likely extirpated from the State**	T	E	NA (Pearl and Tombigbee Rivers)
Kidneyshell (*Ptychobranchus fasciolaris*)		E	Tishomingo County
Monkeyface (*Quadrula metanevra*)		E	Clay, Lowndes and Monroe Counties.
Orange-nacre mucket (*Lampsilis perovalis*)	T	E	Itawamba, Lowndes and Monroe Counties
Ovate clubshell (*Pleurobema perovatum*)	E	E	Clay, Itawamba, Lowndes and Monroe Counties
Pyramid pigtoe (*Pleurobema rubrum*)		E	Coahoma, Hinds, Humphreys, Sunflower, Warren, and Washington Counties
Sheepnose mussel (*Plethobasus cyphus*)		E	Sunflower County

Federally and State-listed Mussel Species in Mississippi	Federal Status	State Status	County Occurrence Records
Slabside pearlymussel (*Lexingtonia dolabelloides*)		E	NA (Lake Pontchartrain)
Snuffbox (*Epilblasma triquetra*)		E	Tishomingo County
Southern clubshell (*Pleurobema decisum*)	E	E	Clay, Itawamba, Lowndes and Monroe Counties
Southern combshell (*Epioblasma penita*)	E	E	Clay, Itawamba, Lowndes and Monroe Counties
Spike (*Elliptio dilatata*)		E	Benton and Sunflower Counties
Stirrupshell (*Quadrula stapes*)	E	E	Lowndes County

Crayfish

Camp Shelby burrowing crawfish (Fallicambarus gordoni), a Federal candidate for listing, State-listed as endangered

This crayfish is restricted to bogs in pitcher plant wetlands in the Leaf River watershed, in the DeSoto National Forest in Perry County, Mississippi.

Plants

Louisiana quillwort (Isoetes louisianensis), Federally-listed as threatened

Louisiana quillwort is restricted to shallow blackwater streams in riparian woodland and bayhead forest areas of pine flatwoods. The plants are found on stable sand and gravel bars, moist overflow channels with silty sand substrates, and on low, sloping banks near and below water level. In Mississippi, there are records from Jackson and Perry Counties.

Pondberry (Lindera melissifolia), Federally-listed as endangered

Pondberry habitat is characterized as seasonally flooded wetlands, such as floodplain hardwood forests and forested swales. Pondberry is usually found in shade, but tolerates full sun. In Mississippi, there are records of approximately 204 colonies, primarily in the Delta National Forest (192 colonies in the Delta National Forest and 12 colonies on private lands approximately 65 miles north of the Forest) (GSRC 2002).

Price’s potato bean (Apios priceana), Federally-listed as threatened

Price’s potato bean is an herbaceous twining perennial vine typically located under mixed hardwoods or in associated forest clearings, often where bluffs or ravine slopes meet creek or river bottoms. Soils are generally well-drained and loamy, formed on alluvium or over calcareous boulders. Several populations extend onto road or powerline ROWs. There are four populations in Mississippi located in three counties: Clay, Oktibbeha, and Lee (Norquist 1990).

American chaffseed (Schwalbea americana), Federally-listed as endangered

American chaffseed is a perennial member of the figwort family found in acidic, sandy or peaty soils in open pine flatwoods, pitch pine lowland forests, seepage bogs, palustrine pine savannahs, and other grass- and sedge-dominated plant communities. It frequently grows in ecotonal areas between peaty wetlands and xeric sandy soils. In these situations, individuals sometimes extend well into the drier communities, but seldom into the areas that support species characteristic of wetter soils. Surrounding plant communities are typically rich in species diversity. There are historic records from Jackson County.

3.4.7 Wildland Fire Ecology and Management

Characteristics of wildfire in southeastern States are discussed in Section 3.2.7, however, the southern one-third of Mississippi generally tends to have the most wildland fire activity (Southern Group of State Foresters 2004). Mississippi's forests and associated species are adapted to regular wildland fire. However, changing land use practices, urban sprawl, land fragmentation, natural disasters such as hurricanes, increasing land values, population increases, and the transition from urban to rural populations results in a build-up of fuels and a need to increase fuels management and wildland fire activities (Southern Group of State Foresters 2004). Through the course of an average year in Mississippi, there are 3,635 individual wildland fires that burn 47,597 acres per year over the last five years (fiscal years 2000–2004) (MFC 2004). The average wildfire size is approximately 10 acres per fire (MFC 2004).

Although Mississippi has WUI areas across the State, relatively few homes and structures are lost to wildland fires annually. An average of 12 homes and eight other structures are lost each year to wildland fires. There are usually 15 vehicles damaged or destroyed by wildland fire each year (Southern Group of State Foresters 2004).

The Mississippi Forestry Commission (MFC) is responsible for protecting 14.8 million acres of private non-industrial forestland within the State (Southern Group of State Foresters 2004). MFC provides forest protection through the placement of county fire crews and by working closely with Federal agencies through cooperative agreements and Memoranda of Understanding MOUs (Southern Group of State Foresters 2004). On Federally managed lands (9.8% of the forestland base), the MFC has mutual aid agreements to support Federal wildland fire suppression efforts. Timber companies suppress wildland fires on their property and at times assist in suppression efforts on private lands (Southern Group of State Foresters 2004).

Since forestlands and species in Mississippi are adapted to regular disturbance by wildland fires to maintain forest health, but suppression activities limit the role of natural wildland fires, managed fuel treatments are needed to maintain forest health. Table 3-14 shows the fuels treatments completed in Mississippi by Department of the Interior agencies and USFS. The BLM did not conduct any fuels treatments in Mississippi over these four years. Over 95 percent of these treatments were completed by the USFS using prescribed fires approximately 80 percent of the time. Over 96 percent of Federal fuels treatments were applied in WUI areas.

Table 3-14. DOI and USDA Fuels Treatment Accomplishments for Mississippi (Acres)

Year	Wildland-Urban Interface			Other			Total
	Fire	Mechanical	Total	Fire	Mechanical	Total	
2006	101,385	117,052	218,437	2,847	846	3,693	222,130
2005	256,138	18,879	275,017	10,312	27	10,339	285,356
2004	251,924	10,496	262,420	16,820	672	17,492	279,912
2003	264,855	605	265,460	6,598	466	7,064	272,524

Source: http://www.fireplan.gov/overview/States/ms.html, accessed March 2, 2007

Fuels treatments, including prescribed fire, are also implemented by the MFC on the private and State-owned forests. In addition, the MFC provides training and permitting to ensure that fuels treatments in these areas, and prescribed fire in particular, are completed in a manner that maintains protects firefighter and public safety, as well as capital improvements and natural resources.

3.4.8 Cultural Resources

Mississippi surface and non-USFS FMO tracts have not been fully surveyed for cultural resources. The surveys that have been conducted were usually initiated by project proponents on a project-specific basis, such as for oil and gas, coal mining, transportation, or water projects, to comply with the requirements of Section 106 of NHPA, 36 CFR Part 800, described in Section 3.2.8.

A cultural resources literature and records search was conducted for BLM surface and non-USFS FMO tracts in the State of Mississippi. The results of the research are presented in an overview (Panamerican Consultants, Inc. 2005a) that is on file at the BLM office in Jackson. The following cultural resource information was taken from Panamerican Consultants Inc. (2005b), unless otherwise noted. Descriptions of the prehistoric periods are provided in Table 3-5. Cultural resources from any of these time periods may be present on BLM-administered surface and non-USFS FMO.

Prehistory

A variety of cultural resource site types attributed to a range of culturally distinct chronological periods from 10,000-plus years ago to the present day have been recorded in the Southeast. The cultural periods represented include Paleoindian, Archaic, Gulf Formational, Woodland, Mississippian, and Protohistoric. Descriptions of the prehistoric periods and general types of cultural materials associated with each one are provided in Table 3-5 in Section 3.2.8.

History

A wealth of Mississippi history is associated with American Indian inhabitants, European exploration, multiple battles, and the evolution of southern culture. These events, discussed below, provide the context and relative importance of the cultural site types that may be encountered on BLM-administered surface and non-USFS FMO.

From the 16th to the 19th century, Spain, France, and England fought for domination and possession of the territories and resources in the southeastern United States. European exploration of this area was discussed in Section 3.2.8. Mississippi was home to many American Indian groups during this time, but European disease epidemics and Chickasaw slave raids greatly reduced their populations (Galloway 1995). The three best known American Indian groups in Mississippi are the Choctaw, Chickasaw, and Natchez (Cushman 1899). The Choctaw, who had the largest population, occupied most of southeastern Mississippi and a portion of western Alabama. The Chickasaw occupied the northeastern section of Mississippi and claimed western Tennessee as a hunting ground. The Natchez occupied the loess bluffs overlooking the Mississippi River in southwestern Mississippi. If any cultural material potentially tied to these Indian Nations is encountered, Federally-recognized Native American tribes will need to be consulted before any undertaking, as discussed in Section 3.2.8.

After the American Revolution, the lands east of the Mississippi River became part of the United States. The Mississippi Territory was created in 1798, and Mississippi became a State in 1817 (Bettersworth 1959; Haynes 1973). The largest population growth and county organization in Mississippi history occurred between 1832 and 1854 (Gonzales 1973). Numerous railroads were chartered, seagoing steamboats came upriver to Natchez, and many domestic travel improvements were made. Land development, the rise of cotton as a major cash crop, and easier means of transporting goods contributed to the State's growing prosperity. Slavery played a vital role in the growth and production of cotton and became a contentious issue in Mississippi and the other States. The pro-slavery States began to move toward secession from the Union, and in 1861, Mississippi voted to secede (Bettersworth 1959). The Mississippi River was of great importance to the Union because it kept the Midwest commerce moving and was a major focus for northern generals during the Civil War. In 1865, the war ended and the slaves were emancipated, which dramatically affected southern agriculture and economics. Sharecropping and tenant farming became the common mode of farming after the abolition of slavery

In the late 1800s, manufacturing in the State was in the form of textile mills. The lumber industry became a growing economic force, as did the cottonseed and fertilizer industries (Bettersworth 1959). Mississippi's centennial celebration was overshadowed by the entry of the United States into World War I. Camp Shelby, near Hattiesburg, was made a major training camp. One of the few air bases in the country was located near the town of Columbus (Bettersworth 1959). Following World War I, the Mississippi River Flood of 1927 covered nearly half of the delta with 30 feet of water for months (Barry 1998; Bettersworth 1959). Nearly 300,000 black americans migrated to northern cities as a result of this flood. Another result was the creation of several large flood-control steps by the U. S. Army Corps of Engineers in Vicksburg (Barry 1998). The Depression followed the flood and Mississippi's economy was once again shattered (Emmerich 1973). World War II and military mobilization brought significant change to the State's economy.

Cultural Sites

As discussed in Section 3.2.8, prehistoric or historic cultural resource sites, structures, or objects listed on or eligible for listing on NRHP are protected and managed as directed by 36 CFR 800. Cultural resources found ineligible for NRHP require no further archaeological work and are not protected by law. Sites are identified as undetermined/unknown when additional work is required to determine the site's eligibility. The nature and location of any archaeological resources are protected under ARPA (also discussed in Section 3.2.8.

Records were searched for 3,698 non-USFS FMO tracts in Mississippi. The records revealed 601 sites, of which 28 sites were considered eligible for NRHP. Most of the tracts have never been surveyed, and there is a high potential for finding additional archaeological sites. There are two sites listed on NRHP that are located near BLM-administered non-USFS FMO tracts.

Records were searched for the BLM surface tract in Mississippi, which cover 174 acres in Hancock County. This tract does not contain any previously recorded sites; however, there are three cultural sites recorded within one-half mile of the tract. There are 20 NRHP-listed properties in Hancock County (NRHP 2004), but only one NRHP-listed archaeological site is located within 800 meters of the tract. Cultural sites on adjacent lands could provide information on the potential for the occurrence and types of sites that could be discovered on the BLM surface tracts; however, these sites are not affected by BLM activities and management. Table 3-15 summarizes the cultural sites identified.

Table 3-15. Cultural Sites on BLM Surface and Non-USFS FMO Tracts in Mississippi

tract Type	Total Sites	NRHP Status		
		Potentially Eligible/ Eligible	Not Eligible	Undetermined/Unknown
Non-USFS FMO Tracts	601	28	173	400

tract Type	Total Sites	NRHP Status		
		Potentially Eligible/ Eligible	Not Eligible	Undetermined/Unknown
Hancock County Surface Tract	0	0	0	0
Areas Adjacent to the Surface Tract[1]	3	3	0	0

[1] One NRHP-listed archaeological site is located within 800 meters of the surface tract.

3.4.9 Visual Resources

Visual resources consist of the natural and manmade features that contribute to a particular environment's aesthetics. These features may be natural (e.g., canyon views) or manmade (e.g., city skyline). Together, they form the overall impression of an area referred to as the landscape character. Visual resources also have a social setting, which includes public values, awareness, and concern about visual quality. VRM classifications are established for public lands so that visual resource values can be maintained through informed management decisions.

The visual resource inventory process contained in *BLM Handbook* H-8410-1 provides BLM managers guidance for determining visual values. The inventory consists of scenic quality evaluation, sensitivity level analysis, and delineation of distance zones. Based on these three factors, BLM-administered lands are placed into one of four visual resource inventory classes. These inventory classes represent the relative value of the visual resource: Classes I and II are the most valued, Class III represents a moderate value, and Class IV has the least value. Management objectives have been assigned to each class. An area may be inventoried as VRM Class III, but a decision may be made to manage it as VRM Class IV, or vice versa. Cultural modifications may detract from the scenery, complement it, or improve the overall scenic quality of an area. Cultural modifications in landform/water and vegetation values and addition of structures will be considered in examining proposed resource management actions.

The following VRM Class definitions from BLM Handbook H-8410-1 have been amended for the purpose of developing and implementing this RMP. Amendments incorporate the visual resource values provided by existing cultural features that are significant to the character of the landscape in Mississippi.

- **VRM Class I Objective:** The objective of this class is to preserve the existing natural and cultural character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not detract from the existing landscape character.
- **VRM Class II Objective:** The objective of this class is to retain the existing natural and cultural character of the landscape. The level of change to the characteristic should be low. Management activities may be visible but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural and/or cultural features of the characteristic landscape.
- **VRM Class III Objective:** The objective of this class is to partially retain the existing natural and cultural character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may be visible but should not dominate the view of the casual observer. Changes should blend with the natural environment.

- **VRM Class IV Objective:** The objective of this class is to provide for management activities that require significant modification of the existing landscape or the existing character of the natural and cultural landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of the casual observer's attention; however, every attempt should be made to minimize the impact of these activities through selective location, minimal disturbance, and repetition of basic elements.

3.4.10 Minerals

There are 517,934 acres of BLM-administered non-USFS FMO in Mississippi that underlie various surface ownership. Surface owners include BLM, DoD, NPS, USFWS, and other Federal agencies. Table 3-16 shows BLM-administered FMO by surface ownership in Mississippi.

Table 3-16. BLM-administered Federal Mineral Ownership by Surface Ownership

Surface Ownership	Federal Mineral Ownership in Mississippi (Acres)
BLM	174
DoD	40,580
NPS	2,797
USFWS	60,207
Other Federal Agencies	12,766
Non-Federal surface	401,410
TOTAL non-USFS FMO	**517,934**
USFS	1,055,227
TOTAL FMO (includes USFS)	**1,573,161**

Minerals—Oil and Gas

The first oil and gas exploration in Mississippi was undertaken in 1903. The Alabama-Mississippi Investment and Development Company in Enterprise, Mississippi, drilled the first well just east of Enterprise in Clarke County. It was a dry hole that was drilled to 1,842 feet. The first commercial discovery occurred near Amory, Mississippi, in Monroe County in October 1926, when gas flowed from the 2,404-foot Amory Petroleum Company Carter Oil #1 well. As of April 2005, there are 27 active oil and gas wells on BLM non-USFS FMO according to data from the Automated Fluid Mineral Management System.

Mississippi oil and gas production data from the Mississippi Oil and Gas Board were available for the period 1951 – 2004. The number of wells increased from 1,780 in 1951 to 4,307 in 2003. The number of wells peaked at 4,530 wells in 1990. Oil production decreased from 27,494,492 barrels in 1990 to 17,238,528 barrels in 2004. Oil production was at its lowest in 2004 and peaked at 65,119,072 barrels in 1970. Gas production decreased from 200,980,232 mcf in 1990 to 174,438,213 mcf in 2004. As of April 2005, 1,223 Federal leases are authorized in Mississippi. There are 42 existing leases on non-USFS FMO and 1,181 leases on USFS FMO.

Map 3-1 shows counties in Mississippi with historical oil and gas production. Reasonable foreseeable development is anticipated in the areas of historical oil and gas production (BLM 2004). The areas of historical production are the salt basin and the coastal plain. BLM projects that 10 wells accessing non-USFS FMO in Mississippi will be drilled over the next 20 years (BLM 2004).

Salt Basin

The salt basin is part of the Gulf Coast geosyncline that contains more than 50 piercement-type salt domes (Spiers and Gandl 1980). The individual salt domes evolved from the uprising of salt from the extensive Jurassic Louann Salt Formation through the overlying sediments. These piercement structures have deformed the younger units. Oil and gas have been found on the dome flanks in the past 20 years.

The oldest rocks in the area penetrated by drilling are those of the Louann Salt. The salt is overlaid by Upper Jurassic sandstones, followed by a thick sequence of cretaceous deposits, which consist primarily of sandstone, limestone, and shale. The Cretaceous deposits are overlain by Tertiary deltaic deposits and alluvium of Quaternary or Recent age.

Coastal Plain

The coastal plain is a continuation of the same feature in the southern Alabama Basin. These lands are in an area dominated by the Gulf Coast geosyncline. This large basin formed in the Jurassic period with a southward downwarping. The basin has accumulated sedimentary deposits as thick as 30,000 feet. Fault zones parallel the basi hingeline and can trap hydrocarbons (Murray 1964). Other structural features, such as small basement highs, also trap hydrocarbons in this area.

The deposits in the major geologic units mainly consist of alternating layers of sand and clay, with occasional beds of carbonates and anhydrite. Permeable horizons exist in all formations, and oil and gas are produced from each horizon in the region, with the Haynesville, Smackover, and Norphlet Formations being important (Cate 1982; Poe 1979; May 1974; Moore 1971; Dinkins 1968).

Leasable Minerals – Coal

Coal resources in Mississippi are not described because consideration of coal leasing in this Draft RMP-EIS is limited to the Warrior coal basin in Alabama. Development of Federal coal resources in Mississippi over the next 20 years is not economically viable because of the depth to the coal.

3.4.11 Recreation and Travel Management

Recreation encompasses various human activities that affect and are affected by resources and other resource uses. Dispersed recreation is characterized by unstructured activities that are not confined to specific locations (such as developed recreation sites). Dispersed recreation can involve various activities, which on the Mississippi surface tract can include saltwater marsh activities such as hunting, fishing, nature study, and boating.

There are no roads on the Hancock County tract. The only effective means of transportation is by watercraft.

The BLM-administered non-USFS FMO includes the mineral estate where the surface is managed by another Federal surface management agency. These properties and installations managed by other Federal agencies as well non-Federal agencies such as private, State, or county are summarized in Table 3-17 and shown on Map 1-1 and Map 1-2.

For those tracts where the surface is managed by other surface management agency, and where public access for recreation and oil and gas leasing are permitted, recreation experiences and resulting benefits could be affected by BLM management actions. Information on public recreation and minerals leasing on other Federal surface management agencies is listed in Table 3-17.

Table 3-17. BLM-administered non-USFS Federal Mineral Ownership[1] by Surface Management Agency in Mississippi

Surface Management Agency	Installations/Areas	Public Access for Recreation (Yes/No)[2]	Mineral Leasing (Open/Closed)[2]
USFWS	Grand Bay NWR	Yes	Closed
	Mississippi Sandhill Crane NWR	No	Closed
	Bogue Chitto NWR	Yes	Closed
	Panther Swamp NWR	Yes	Closed
	Hillside NWR	Yes	Closed
	Noxubee NWR	Yes	Closed
DoD	Meridian Naval Air Station (Navy)	ND	Open
	Alpha Naval Auxiliary Station (Navy)	ND	Open
	Multipurpose Target Range (Navy)	ND	Open
	Aliceville Lake (Army Corps of Engineers)	Yes	Open
	Columbus Lake (Army Corps of Engineers)	Yes	Open
	Aberdeen Lake (Army Corps of Engineers)	Yes	Open
	Grenada Lake (Army Corps of Engineers)	Yes	Open
	Enid Lake (Army Corps of Engineers)	Yes	Open
	Sardis Lake (Army Corps of Engineers)	Yes	Open
NPS	Vicksburg National Military Park	Yes	Closed
	Natchez-Trace National Parkway	Yes	Closed
	Gulf Island National Seashore	Yes	Closed
	Other small NPS sites	Yes	Closed
Other	Areas Managed by Other Federal Agencies	No	Varies

ND means no information was available from the surface managing agency.

1 Does not reflect BLM FMO for BLM surface tracts (174 acres).

2 Closed means closed to new leases. Existing leases could be present on areas currently closed.

BLM administration of travel resources in Mississippi is limited to access routes associated access/maintenance routes for ROW such as transmission lines. Public travel routes are administered and maintained by other Federal, State, and local agencies. Information on tract-specific travel resources are contained in Section 3.5.

3.4.12 Lands and Realty

The goals of the lands and realty program are to manage the public lands to support the goals and objectives of other resource programs, provide for uses of public lands in accordance with regulations and compatibility with other resources, and improve management of the public lands through land tenure adjustments. The lands and realty program is a support program to all other resources to help ensure that BLM-administered lands are managed to benefit the public. Current conditions of lands and realty on the BLM-administered surface tracts is discussed in Section 3.5.

3.4.13 Social and Economic

BLM surface lands for this planning effort in Mississippi are located in an isolated section of Hancock County. BLM-managed non-USFS FMO is scattered throughout the State. Thus, the description of affected environment for Mississippi will focus on general socioeconomic information for the State, in addition to descriptions of notable statistics in counties within the State.

Economic Characteristics

Household and Personal Income

Median household income for Mississippi was $32,397 in 2003 (U. S. Census Bureau). Information on per capita income was obtained from U. S. Census Bureau and indicates that average per capita income reported for 2004 in Mississippi is $24,518. Gross State Product in 2003 was $72 billion (BEA). In 2005, Mississippi ranked 50th in the United States in per capita income (including the District of Columbia). According to BEA, Mississippi per capita income is 71 percent of the national average of $36,608 (2006$).

Some of the nation's poorest counties are located in Mississippi, with approximately 13 counties that are within the 100 poorest counties in the nation in terms of per capita income. The counties and their associated average per capita income are located in Figure G-7. These counties are located primarily along the western border of the State. In contrast, Mississippi does not have any counties that are within the wealthiest 100 counties in the nation. Rankin County, encompassing many of the suburbs of Jackson, has the highest per capita income of $30,849 in 2006$.

Employment and Compensation

Employment for the State was 1.5 million in 2005 (BLS). Figure F-8 summarizes the employment by industry for 2005. In 2005, there were three large employers in Mississippi: government (18%), manufacturing (12%), and retail trade (11%), comprising 41 percent of the total employment for the State. Other industries in the State include healthcare, accommodation and food service, and construction. Table 3-18 summarizes the employment by industry between 2000 and 2005.

Table 3-18. Employment by Industry, 2000 – 2005

Industries	2000	2001	2002	2003	2004	2005	Percent Change 2000-2005
Retail Trade	171,882	171,104	170,592	172,291	172,384	174,166	-1
Transportation	51,141	50,901	49,587	49,506	48,992	50,193	2
Finance and Insurance	47,734	47,357	47,282	47,530	47,128	47,986	-1
Real Estate	38,092	35,730	32,986	32,833	32,070	32,089	19

Industries	2000	2001	2002	2003	2004	2005	Percent Change 2000-2005
Professional Services	56,268	52,825	50,148	48,683	48,081	46,980	20
Administrative and Waste Services	68,605	63,810	59,262	57,212	54,206	57,252	20
Health Care	124,422	122,515	120,171	116,127	111,908	108,386	15
Accommodation and Food Services	118,503	119,166	117,468	114,441	106,631	106,168	12
Other Services	84,969	84,979	80,702	80,009	76,930	75,441	13
Government	277,404	281,982	281,442	277,815	275,254	273,722	1
Farming	50,367	50,874	51,031	53,668	53,062	54,955	-8
Construction	90,915	85,724	85,348	86,899	86,020	88,129	3
Manufacturing	183,425	184,519	183,613	192,715	205,517	224,759	-18
Wholesale Trade	39,751	39,250	38,667	38,814	39,102	41,262	-4
Other	101,789	102,410	102,265	104,382	112,102	111,184	-8
Total Employment	**1,505,277**	**1,493,146**	**1,470,564**	**1,472,925**	**1,469,614**	**1,492,672**	**6**

Source: Bureau of Labor Statistics

Government, retail trade, and construction industries have remained relatively stable over the past several years, while the manufacturing industry has decreased its employment in the State by 18 percent and the health care and accommodation and food services industries have increased employment by 15 and 12 percent, respectively.

The unemployment rate in Mississippi has been consistently above the national average, as depicted in Figure G-9. The employment rate peaked to 8.8 percent in 2005, likely as a result of the devastation of Hurricane Katrina. Figure G-10 shows a map of Mississippi unemployment rates by county and indicates that the highest unemployment rates are in Jefferson, Sharkey, Humpreys, Holmes, and Noxubee Counties.

Oil and gas also provides employment and income within the State. However, over the past 20 years, BLM has permitted 7 wells of a total of 7,362 wells permitted within the state. Therefore, although these BLM-administered oil and gas resources do contribute to employment and earnings in this area, it is a fairly small amount.

Social Characteristics

Demographics

Population trend data were obtained from the Census Bureau. Figure G-11 (Appendix G) shows the State's population trend between 2000 and 2005, a percentage change of three percent over the six-year time period. The densest counties include Hinds and Rankin, both comprising the Jackson metropolitan area, as well as Harrison and Jackson Counties, on the southeastern coast. DeSoto County, comprising the suburbs of Memphis, Tennessee, also has a relatively dense population. Counties that have fairly low population densities relative to the other counties in the State include Webster, Choctow, Quitman, Franklin, Jefferson, Issaquena, and Benton. Counties experiencing very high growth rates between 2000 and 2005 include DeSoto (26%), Lamar (13%), and Rankin (13%). On the other hand, Issaquena and Sharkey Counties are decreasing in population—15 and 9 percent, respectively. The median age of the State population in 2000 was estimated to be 33.8, which is slightly lower than the nation's median of 35.3 (U. S. Census 2000).

Housing

In the State, 90.1 percent of the 1.1 million housing units were occupied in 2000. Homeowners inhabited 72.3 percent of the total occupied housing units. The State has a low homeowner vacancy rate, 1.6 percent, indicating that most of the owner-occupied homes in Mississippi are occupied by owners and are not second homes. The average household size for owner-occupied units is 2.67 people, as compared to 2.52 for rental-occupied units (U. S. Census Bureau 2000). In 2000, the median value of a housing unit was $71,400, 59 percent of the national median value of $119,600. Although the personal income is less than the national average (71%), the cost of housing is significantly lower (59%), indicating that the cost of living in Mississippi is likely lower than the nation, on average.

Education

Of the State's population above age 25, 72.9 percent has graduated from high school and 16.9 percent hold a bachelor’s degree (U. S. Census 2000). This is lower than the national average for high school graduates (80.4%) and bachelor’s degree (24.4%). Ninety-six percent of the State’s population speaks English at home.

Attitudes and Beliefs of Mississippi Stakeholders

In Mississippi, BLM has responsibility for a number of issues and decisions that could be important to stakeholders and their beliefs, including Federal land disposal and oil and gas development. This section will briefly describe stakeholders’ attitudes and beliefs related to these specific issues to provide a social context for these decisions.

Public lands are important in providing a natural resource base for economic activities. The potential additional oil and gas development will be supported by some stakeholders and not by others. Stakeholders who support oil and gas development believe that domestic production of resources will reduce the nation's dependency on foreign oil and gas sources and potentially affect prices. Additionally, the oil and gas industry has contributed to the tax base of both counties and the State, providing funds for local, regional, and State governments, infrastructure, schools, and other community services. Many people believe that this funding is vital to the economy of Mississippi Counties and the State.

Conservation-focused stakeholders may not support oil and gas development or might support conditions and stipulations on development and production to reduce negative impacts to the surface and subsurface. These environmental stakeholders are concerned about erosion and water quality impacts associated with road and wellpad construction and water disposal in the production process. Some stakeholders believe that the potential long-term environmental risks of development are considerable compared to the short-term benefit of the resource extracted. Additionally, these types of stakeholders believe that oil and gas impacts such as increased road building, associated road traffic, dust, and noise add to the negative impacts associated with this type of development.

Public land disposal may also be a contentious issue with the public. The BLM in Mississippi manages one pocket property, the Hancock County tract, located on the southern coast of Mississippi. Preservation-oriented stakeholders are concerned about protecting open spaces and limiting development on these lands, often to maintain a quality of life that the property provides. For example, quality of life attributes could include recreation, such as bird-watching or walking, solitude, and the knowledge that the property provides important wildlife habitat. Therefore, these types of stakeholders believe that keeping the surface lands in Federal ownership is preferable or selling these lands to organizations interested in preserving the lands. Developers might be interested in purchasing these lands for their economic value due to their location on the coast if the lands are buildable. Additionally, some people may feel that disposing of Federal lands provide fiscal revenues as private property taxes can be collected.

Environmental Justice

The environmental justice purpose and threshold criteria are provided in Section 3.2.13.

Poverty level estimates for the State were estimated to be 19.9 percent, compared to the national average of 12.5 percent, as shown in Figure G-12 The poverty levels in the State are below the set threshold of 20 percent for low-income populations. Table 3-19 shows the 10 poorest counties in Mississippi and the associated percentage of the population below poverty, located primarily along the western border of the State.

Table 3-19. Poorest Counties in Mississippi

Counties	Percent of Population Below Poverty
Wilkinson County	28.1
Jefferson County	28.2
Coahoma County	28.4
Washington County	28.5
Leflore County	29.5
Sharkey County	29.5
Issaquena County	29.6
Humphreys County	30.2
Sunflower County	30.5
Holmes County	32.4

Source: Bureau of Census, 2000

Ethnicity information for the State was obtained from the U. S. Census Bureau and is summarized in Figure G-13. In 2005, the State was predominantly Caucasian (61.2 percent). The remaining race distribution is Black or African American (36.9 percent); Hispanic or Latino (1.7 percent); Asian (0.7 percent); two or more races (0.6 percent); American Indian or Native Alaskan (0.4 percent); and Native Hawaiian or other Pacific Islander (0 percent). The ethnic representation in Mississippi indicates than on average Mississippi has fewer minorities than the rest of the nation. There are obvious variations in ethnicity across the State. In 2000, 24 of the 82 counties in Mississippi have Black or African American populations of greater than 50 percent (Bureau of Census, 2000). Sixteen counties in Mississippi have Blacks or African Americans representing 60 percent or greater of the population. These 16 counties and the percentage of Black and African Americans are shown in Table 3-20.

Table 3-20. Mississippi Counties with Black or African American Populations, 2000

Counties	Percent of County Representing Black or African American Ethnicity
Bolivar	65.1
Claiborn	84.1
Coahoma	69.2
Hinds	61.1
Holmes	78.7
Humphreys	71.5
Issaquena	62.8
Jefferson	86.5
Leflore	67.6
Noxubee	69.3
Quitman	68.8
Sharkey	69.3
Sunflower	69.9
Tunica	70.2
Washington	64.6
Wilkinson	68.2

Source: Bureau of Census, 2000

3.4.14 Hazardous Materials

BLM-administered public lands and minerals provide opportunities for a variety of commercial uses in addition to resource management. Both activities can lead to releases of hazardous substances and creation of hazardous waste sites. The BLM engages in hazardous material emergency response actions, site evaluations, and prioritization of cleanups in accordance with laws and regulations. This involves working with the EPA, State environmental quality departments, counties, and potentially responsible parties (both public and private) to fund and expedite the cleanup of hazardous sites. Those sites that are an imminent threat to public health and safety, as well as those sites that are under a consent order and can therefore generate penalties and fines, are a priority for the Bureau. There are no known hazardous, toxic, or unapproved solid waste sites on public lands within the planning area.

3.5 MISSISSIPPI SURFACE TRACT DESCRIPTION

The surface tract descriptions in this section include available detail on the Hancock County tract described in Chapter 2. General information and tract-specific information on soil resources, water resources, vegetative communities, fish and wildlife, special status species, cultural resources, visual resources, recreation and travel management, and lands and realty are provided. Air quality, wildland fire ecology and management, minerals, and social and economic conditions are discussed in Section 3.4.

General. This section provides basic location and size of the surface tract, as well as available background information.

Soil Resources. This section provides a table of the soils present at the tract, the erosion hazard potential as indicated by NRCS, and the presence of prime or unique farmlands (defined in Section 3.4.2).

Water Resources. This section describes which drainage basin the surface tract is within.

Vegetative Communities. This section summarizes the vegetative communities related to the tract. An analysis of the available GAP data was used to delineate the vegetative communities on the surface tracts. The GAP is coordinated by the Biological Resources Division of USGS.

Fish and Wildlife. This section summarizes the fish and wildlife species associated with the tract. GAP provides geographic information on the status and location of species and their habitat. The GAP is coordinated by the Biological Resources Division of USGS.

Special Status Species. This section summarizes the special status species associated with the tract. GAP provides geographic information on the status and location of species and their habitat. The GAP is coordinated by the Biological Resources Division of USGS. Available special status species occurrences on the tracts are discussed. Appendix E provides additional information on special status species in the areas around the surface tract.

Cultural Resources. This section summarizes the known sites and cultural resources survey information for the surface tract.

Visual Resources. This section addresses the visual setting of the surface tract. The surface tract is currently classified according to a VRM system. VRM Classifications are described in Section 3.4.9. The Hancock County tract has not been inventoried for VRM classification.

Recreation and Travel Management. This section addresses the existing recreational and travel management activities on the surface tract.

Lands and Realty. This section addresses the lands and realty actions associated with the surface tract, including withdrawals, disposals, and ROW actions.

3.5.1 Hancock County Tract

General

One tract comprising about 174 acres in Hancock County, Mississippi, was patented to the University of Mississippi in 1961 under the R&PP Act; however, the patent contains a reversionary clause. This Draft

RMP-EIS provides for management of these tracts should the patent be revoked and the tracts returned to BLM administration.

Soil Resources

The soil classification for the Hancock County tract is provided in Table 3-21.

Table 3-21. Soil Classification for the Hancock County Tract

Soil Type	Description	Erosion Hazard	Prime Farmland
Eustis loamy fine sand, 2 to 5 percent slope	Somewhat excessively drained soils, nearly level to steep areas of coastal plain; surface and subsurface consisting of sands and subsoils consisting of a fine loamy sand	Slight	No
Handsboro association	Very poorly drained soils in tidal marshes; surface layers of mucky silt loam	None	No

Water Resources

The Hancock County tract is located within the Coastal Streams drainage basin.

Vegetative Communities

The 174-acre Hancock County tract is located in the Hancock Marshes Coastal Preserve, part of a State-designated 83,000-acre estuarine preserve system bordering the Mississippi Sound from the Pearl River to Point Clear. The 13,570-acre Hancock County Marshes unit protects the second largest continuous marsh area in the State. These coastal marshes include several low ridges and small hammocks, the most prominent in this unit being Point Clear Island and Campbell Island. These elevated sandy areas have characteristics similar to the barrier islands and include forested areas supporting slash pine with redcedar and sand live oak (*Quercus geminata*). The BLM tract is located in the center of the preserve and is bordered by Bryan Bayou to the north. The very southeastern corner of the tract includes a portion of Point Clear Island. The bulk of the tract is part of a needlerush marsh that dominates the area between Bayou Caddy/Bryan Bayou and Point Clear Island. Hurricane Katrina deposited substantial amounts of flotsam in some areas of the marshes.

No exotic invasive species are known to occur on this tract, but cogon grass and torpedo grass are a concern in the area of Point Clear Island.

Fish and Wildlife

The marsh area is well known for an abundance of waterfowl and wading birds, including white-faced ibis and black-crowned night heron. Swallowtail kite numbers are high during the summer months.

Special Status Species

The special status species utilizing the Hancock County Marshes include mottled duck (*Anas fulvigula)*; royal tern (*Sterna maxima)*; Mississippi diamondback terrapin *(Malaclemys terrapin pilea*); Gulf salt snake (*Nerodia clarkii clardii)*; brown pelican (*Pelecanus occidentalis*); least tern (*Serna antillanum*);

American oystercatcher (*Haematopus palliates*); and gull-billed tern (*Sterna nilotica*). The islands of this marsh support several rare plant species including the tiny-leaved buckthorn (*Sageretia minutiflora*), which in this area is restricted to rare shell middens.

Cultural Resources

The Hancock County tract has not been surveyed. However, three cultural sites are recorded within one-half mile of the tracts.

Visual Resources

The Hancock County tract is remote and not visible from residential or other types of development. The visual character is low-lying wetlands with relatively dense vegetation and limited human activity.

Recreation and Travel Management

The Hancock County tract is patented to the University of Mississippi for the purposes of research and recreation. The tract is used for dispersed recreation, but it is primarily wetland and is not easily accessible to the public. Travel to the area is generally by boaters and anglers on an occasional and seasonal basis for fishing and waterfowl hunting.

Lands and Realty

The Hancock County tract was patented to the University of Mississippi in 1961, under the authority of the R&PP Act. The tract is still owned by the University. Under terms of the patent, the tract is to be used only for recreational and research site purposes. The patent contains a clause stating that ownership of the surface estate will revert to the United States if the land is devoted to a use other than that for which the land was conveyed. It is expected that the university will relinquish this tract and that title will revert to the United States. In anticipation of the title transfer, this tract is being considered BLM-managed surface estate for land use planning purposes. There are no ROW on the tract, and no request for ROW or other uses are expected in this relatively remote area.

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CHAPTER 4—ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter evaluates potential environmental impacts that could occur from implementing management actions included in each of the alternatives discussed in Chapter 2 for Bureau of Land Management (BLM)-administered surface tracts and non-U.S. Forest Service (non-USFS) Federal mineral ownership (FMO) in Alabama and Mississippi[1]. Potential impacts considered in this chapter include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, and health (40 Code of Federal Regulations [CFR] §1508.8) impacts. The baseline used for determining the potential impacts is the current resource condition described in Chapter 3. Resources are discussed in the same order that they are presented in Chapter 3.

The analysis focuses on impacts that could eventually result in on-the-ground changes by planning for uses on surface and non-USFS FMO tracts over the next 20-years. Some BLM management actions may affect only certain resources and only under certain alternatives. Some impacts may be from actions that are common to all alternatives. If an activity or action is not addressed in a given section, no impacts are expected or the impact is expected to be minimal.

4.1.1 How to Read This Chapter

This chapter is divided into four sections:

- **Introduction (Section 4.1)**—This section provides direction on How to Read This Chapter (Section 4.1.1), presents the approach to the analysis including types of effects (Section 4.1.2), and discusses availability of data and incomplete information (Section 4.1.3).
- **Direct and Indirect Impacts from BLM Management Actions in Alabama (Section 4.2)**—This section discusses potential impacts anticipated from implementation of management actions under each alternative for the Coosa River, Fort Morgan Beach, Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts in Alabama and 313,819 acres of non-USFS FMO in 57 Alabama counties, mostly composed of split-estate.
- **Direct and Indirect Impacts from BLM Management Actions in Mississippi (Section 4.3)**—This section discusses the potential impacts anticipated from implementation of the management actions under each alternative for the Hancock County tract in Mississippi and for non-USFS FMO on about 517,934 acres in 79 Mississippi counties, mostly composed of split-estate. Impacts from the allowable uses and management actions proposed for the Hancock County Tract are analyzed if the Recreation and Public Purposes (R&PP) patent held by the University of Mississippi were to revert to BLM.

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[1] In those areas where (1) the Federal land surface is administered by the USFS, and (2) planning decisions for surface management and for mineral leasing, pursuant to the Federal Onshore Oil and Gas Leasing Reform Act of 1987 and Federal regulation (36 CFR 228.102), are the responsibility of USFS, and (3) BLM has responsibility for issuing and administering mineral leases; the RMP will not include management decisions for the Federal minerals on these lands, and BLM will carry out its minerals management responsibilities under the guidance of USFS land use plans. At the same time, surface and minerals management actions and development activities anticipated on these lands will be taken into account for purposes of cumulative impact analysis.

- **Cumulative Impacts (Section 4.4)** —This section discusses the potential cumulative impacts anticipated from implementation of the BLM management actions proposed for Alabama and Mississippi in the context of other actions occurring across the State, including other Federal agency and non-Federal actions.

4.1.2 Approach to the Analysis

This section provides the basic framework used in the impacts analysis. Definitions of types of effects and terminology, general types of impacts analyzed for each resource, analytical assumptions, and cumulative projects and activities considered in the analysis are further discussed in the following subsections.

Types of Effects

The analysis of the alternatives focused on identifying types of impacts and estimating their potential significance. Throughout this chapter, the terms "impact" and "effect" are synonymous. Although impacts may be perceived as positive (beneficial) or negative (adverse), those determinations are left for the reader of this document to make. An overview of impacts is presented in Table 4-1.

Table 4-1. Types of Impacts

Type	Description
Direct Impacts	These are effects caused by the action and occur at the same time and place. For example, elimination of original land use through erection of a structure. Direct impacts may cause indirect impacts, such as ground disturbance resulting in resuspension of dust.
Indirect Impacts	These are effects that are caused by the action but occur later in time or are further removed in distance but are still reasonably foreseeable and related to the action by a chain of cause-and-effects. Indirect impacts may reach beyond the natural and physical environment (e.g., environmental impact) to include growth-inducing effects and other effects related to induced changes to resource users (e.g., social impact).
Cumulative Impacts	These are effects that result from the incremental impact of the action when it is added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions that take place over time.

For ease of reading, impacts presented are direct, broad (occurring within the larger planning area), and long term, unless otherwise noted as indirect, localized, or short term/temporary. Potential significant impacts are identified as they arise, and analysis of why an impact is considered significant is explained. The concept of significance requires consideration of the context, intensity, and duration of the impact. Context relates to environmental circumstances at the location of the impact and in the immediate vicinity, as well as the interests that are potentially affected. Intensity refers to the severity or extent of the impact or magnitude of change from existing conditions. Duration refers to the permanence and longevity of the impacts, which is depicted as short term or long term. Short term is defined as anticipated to begin and end within the first five years after the action is implemented. Long term is defined as lasting beyond five years to the end of or beyond the 20-year planning time frame addressed in the Resource Management Plan (RMP).

4.1.3 Availability of Data and Incomplete Information

As is typical in programmatic planning efforts, site-specific data is used to the extent possible and may not be entirely available. The best available information that is pertinent to management actions was used in developing the RMP and Environmental Impact Statement (EIS). Considerable effort has been taken to acquire and convert resource data into digital format for use in the plan—both from BLM sources and from outside sources, such as the Natural Heritage Program and the National Resources Conservation Service (NRCS).

Certain information was unavailable for use in developing this plan, usually because inventories were not conducted or complete. Some of the major types of unavailable data include: Native American traditional use areas; cultural surveys; data collection of visitor use trends; visual resource inventory (VRI); field inventory of soils and water conditions; and field inventory of wildlife, vegetation, and special status species.

As a result, some impacts cannot be quantified given the proposed management actions. Where this gap occurs, impacts are projected in qualitative terms or, in some instances, are described as unknown. Subsequent project-level analysis will provide the opportunity to collect and examine site-specific inventory data required to determine appropriate application of RMP-level guidance. In addition, ongoing inventory efforts by BLM and other agencies within the planning area would be used to continue to update and refine information used to implement this plan.

4.2 DIRECT AND INDIRECT IMPACTS FROM BLM MANAGEMENT ACTIONS IN ALABAMA

This section discusses potential impacts anticipated from implementation of management actions under each alternative for the Coosa River, Fort Morgan Beach, Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts in Alabama and 313,819 acres of non-USFS FMO in 57 Alabama counties, mostly composed of split-estate.

The section is organized by alternative, and then by resource. Under each resource, each management action is discussed, including: vegetative communities; fish and wildlife habitat; minerals; recreation and travel; and lands and realty. A discussion of cumulative impacts for each resource is contained in Section 4.4.1.

4.2.1 Alternative 1 (No Action)

Air Quality

Under this alternative, there is a potential for wildfire which could lead to air emissions. Since all fires would be suppressed, these occurrences would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground disturbing activities of a severity or extent that would deteriorate air quality conditions. Prescribed burning conducted to meet vegetation resource objectives would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground disturbing activities of a severity or extent that would deteriorate air quality conditions. Prescribed burning conducted to meet habitat objectives would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Minerals Management Actions

Combustion processes, construction activities, and vehicle travel associated with potential oil and gas development and coal mining produce air emissions. Estimated emissions from the development of 20 wells over the next 20 years on BLM-administered non-USFS FMO would produce considerably less emissions than the combined emissions from total planned oil and gas developments in the State (presented in Table 4-2). Those emissions would likely occur over a dispersed geographic area and would therefore not cause any noticeable or measurable effect.

Potential oil and gas leasing on BLM-administered non-USFS FMO are in close proximity to the Sipsey Wilderness and the Birmingham nonattainment area. These emissions could potentially deteriorate wilderness air quality values and jeopardize ambient air quality attainment. Since emissions would be dispersed over a large geographic area, air quality impacts would not be anticipated.

On the basis of a conservative estimate, it is anticipated that 1.9 million tons of Federal coal would be produced annually over the next 20 years (BLM 2005b). The results are shown in Table 4-3. Since the analysis is qualitative and coal production data are limited throughout the State, a comparison with best available data from the Warrior Basin is provided. As shown in Table 4-3, BLM proposed coal mining activities are less in comparison to the Warrior Basin activities and will therefore produce much less emissions.

Table 4-2. Maximum Potential Oil and Gas Air Emissions for BLM and Non-BLM Activities in Alabama (tons per year)[1, 2]

Well Locations	Emission Type/Pollutant				
	Nitrogen Oxides (NO_x)	Sulfur Dioxide (SO_2)	Particulate Matter (PM_{10})	Carbon Monoxide (CO)	Volatile Organic Compounds (VOC)
BLM-Administered non-USFS FMO Estate in Alabama	110	1.7	35.1	111	67.1
Other Mineral Estate Across Alabama	21,460	332	6,815	21,761	13,947

1. Using conservative assumptions typical of liquid mineral wells on BLM lands.
2. Assumption that 25 percent of wells are conventional natural gas wells and 75 percent wells are coal-bed natural gas wells (BLM 2005a).

Table 4-3. Maximum Potential Coal Mining Air Emissions for BLM and Non-BLM Activities in Alabama (tons per year) [1, 2]

Mine Locations	Emission Type/Pollutant				
	NO_x	SO_2	PM_{10}	CO	VOC
BLM-Administered non-USFS FMO Estate in Alabama	61.2	6.8	48.6	108.0	5.7
Warrior Basin	684	76	5,433	1,207	64

1. Using EPA-approved emissions factors and conservative assumptions typical of western surface mines, because emission factors do not exist for eastern surface mining. Assumption that all emissions eventually are introduced into the environment (EPA 1995 and BLM 2004).

Impacts from Recreation and Travel Management Actions

Short term, localized increases in dust and emissions could potentially occur from recreation activities and travel on unpaved roads. Given the small amount and scattered nature of surface ownership, these activities would not be anticipated to individually deteriorate air quality conditions.

Impacts from Lands and Realty Management Actions

Short term, localized increases in dust and emissions would occur from use of trucks and heavy equipment (bulldozers, etc.) in rights-of-way (ROW) development. These actions would be conducted in accordance with the Alabama State Implementation Plan (SIP) and local dust control regulations; however, given the small amount and scattered nature of surface ownership, lands and realty management actions would not be anticipated to individually deteriorate air quality conditions or violate air quality standards or regulations.

Soil Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in disturbance or loss of soils.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in disturbance or loss of soils.

Impacts from Minerals Management Actions

Mineral exploration, development, and operations on non-USFS FMO would include ground-disturbing and potential contaminant-introducing activities that could impact soils. Oil and gas development operations—specifically, construction of drilling pads, reserve pits, and access roads—would disturb topsoils and alter surface soil characteristics, which could result in both a slight decline in soil productivity and an increase in surface runoff. Shallow coalbed methane wells generally require small 1-2 acre well pads. Because much of the Black Warrior River Basin has very rolling terrain up to 3 acres could be needed to construct a suitably flat drill pad. Cut and fill areas to support these pads and access routes can contribute to local soil erosion, especially when heavy or persistent rains typical of this region exacerbate the situation. Ground disturbing activities in areas where the soils are classified as no or slight to moderate erosion hazard not generally accelerate soil erosion. Since future coal development is anticipated to be subsurface and use existing infrastructure, these activities would not disturb the soils on the surface.

Except for 8,179 acres closed to leasing by other surface managing agencies, non-USFS FMO would be open to leasing subject to standard lease terms and conditions (305,640 acres). The estimated 20 wells to be developed on non-USFS FMO in Alabama over the next 20-years would disturb approximately 105 acres. Both Federal and State laws would require the reclamation of mined lands concurrently with mining operations; therefore, the required reclamation and the minimal surface that might be disturbed would produce only localized effects on soils.

Operation of the oil and gas wells could also impact the surrounding soils by potential contamination from accidental spills or improper management of hazardous materials or waste; however, Federal, State, and local regulations would require site characterization and corrective action to restore soil integrity and productivity.

In few locations there are prime or unique farmlands on non-Forest Service FMO. Though not likely, it is possible that some of the 105 acres of soil disturbance could be on prime or unique farmland. In the event development is proposed in such an area, BLM would implement appropriate mitigation measures to avoid or minimize impacts as described in section 2.3.3.

Impacts from Recreation and Travel Management Actions

Allowing recreation activities, including motorized vehicle use on the surface tracts, could result in short term and site-specific increases in erosion. Given the limited interest in recreation and travel on the surface tracts, any potential effects would be minor and localized.

Impacts from Lands and Realty Management Actions

If construction were to occur in new or existing ROWs, soils could be impacted by vegetation clearing activities and ground disturbance. Wind and water erosion, and subsequent loss in soil productivity would occur in disturbed areas where revegetation does not occur. These effects would be localized and short term in areas where revegetation is enhanced or permitted. The effect would be long term if roads or structures were constructed on the tracts, but would be localized.

Water Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to water quality.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to water quality.

Impacts from Minerals Management Actions

Except for 8,179 acres closed to leasing by other surface managing agencies, non-USFS FMO would be open to leasing subject to standard lease terms and conditions (305,640 acres). The estimated development of 20 wells in Alabama over the next 20 years would disturb approximately 105 non-USFS FMO acres. Both Federal and State laws would require the reclamation of mined lands concurrently with mining operations; therefore, the required reclamation and the minimal surface that might be disturbed would result in only localized effects on water resources.

Mineral exploration, development, and operations would include ground-disturbing activities that increase surface run-off, which increases nutrient levels and turbidity and decreases water quality. These activities could also introduce hazardous waste or result in accidental spills that could also deteriorate surface water quality. Leakage of drill fluids, hazardous waste spills, or leakage from reserve pits could be introduced into the ground water as well. Although Federal, State and local regulations would require site characterization and corrective action for hazardous waste and spills, impacts to the water quality could be localized but long term and especially affect nonflowing waterbodies (e.g., small ponds or wetlands) and ground water resources. Additionally, access roads and well pads can alter the local hydrology reducing surface flow to mesic areas and diverting or degrading surface water. Installation of culverts and diverting existing drainages around well pads help to maintain existing hydrologic systems, but the disturbance causes local sedimentation and can retard sheet flow.

The preferred method of disposal of water produced from oil and gas production would be underground injection. Reinjection of produced water would prevent impacts to surface water quality; however, a critical aspect of underground injection is finding a permanent formation with a concentration of total dissolved solids (TDS) greater than 10,000 mg/L (Geological Survey of Alabama [GSA] 2005). At present, stream discharge is the most common method of water disposal produced from oil and gas production in the Warrior Basin.[2].Although the surface discharge of produced water into water systems could potentially increase the salinity of surface waters and increase flow rates, result in increased soil erosion, operators must obtain a National Pollutant Discharge Elimination System (NPDES) permit (administered by Alabama Department of Environmental Management [ADEM]) to discharge produced water into streams in Alabama. The type of permit currently offered is a Tier II permit. This permit requires the monitoring of water quality in streams and limits instream TDS concentrations to 230 mg/L (GSA 2005). Because surface discharge of produced water would be a permitted activity requiring standards of water quality, direct impacts to water quality from the disposal of water produced from oil and gas production on non-USFS FMO would be minimized. Also, methods of disposing produced water, other than by reinjection, would be considered but would require preparation of additional National Environmental Policy Act of 1969 (NEPA) analysis that would identify conditions of approval (COAs) or best management practices (BMPs) to alleviate the potential for extensive harm to water quality.

Impacts on groundwater from coal mining operations would also occur. Approximately 9,000 acres of new coal leases in the Warrior Basin coal field would yield an estimated average of 1.9 million tons of coal per year over the next 20-years. Coal development in the Warrior Basin would involve mining of existing underground coal mines, which would further increase the potential for groundwater contamination. Migration of contaminants into the surrounding soils and aquifers could degrade groundwater quality and thereby affect wells and springs that may serve household and domestic uses.

Impacts from Recreation and Travel Management Actions

Managing the surface tracts as open to recreation and motorized vehicle use could result in short term and site-specific increases in erosion and surface run-off, which increases nutrient levels and turbidity and decreases water quality. Given the limited interest in recreation and travel on the surface tracts, any potential effects would be minor and localized.

Impacts from Lands and Realty Management Actions

If construction were to occur in new or existing ROWs, vegetation-clearing activities and construction ground disturbance would increase soil erosion and surface run-off, which increases nutrient levels and turbidity and decreases water quality. Impacts would be short term in areas where revegetation was enhanced or permitted. The effect would be long term if roads or structures were constructed on the tracts, but would be localized.

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[2] The term Warrior Basin is a geologic province. The Black Warrior Basin is the drainage area of the Black Warrior River.

Vegetative Communities

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could increase the potential for exotic, invasive species to become established or spread on BLM surface tracts. Chinese privet is present and likely to continue to spread on the Coosa River tracts. The Fort Morgan highway tracts are vulnerable to both Cogon grass and Chinese tallow. Cogon grass in particular, once established, would displace native herbaceous plant species and ultimately could reduce some shrub and tree components by increasing the frequency of wild fires and crowding out seedlings.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under impacts from vegetative communities management actions.

Impacts from Minerals Management Actions

Impacts to vegetation from oil and gas development in Alabama are dependent on the location and design of well pads, roads, and production facilities. Since 1983, all of the wells drilled on non-USFS FMO in Alabama have been in the Black Warrior River Basin, almost all in Tuscaloosa County. Typically vegetation in this area is dominated by oak/hickory/pine forests, much of it secondary growth managed as commercial timberlands. Older growth is most often found in steeper more protected terrain, areas that could harbor mesic forests. Shallow coalbed methane wells generally require small 1-2 acre well pads. Because much of the Black Warrior River Basin has very rolling terrain, up to three acres can be needed to construct a suitably flat drill pad. Cut and fill areas can contribute to local erosion and heavy or persistent rains typical of this region exacerbate the situation. This erosion can degrade the adjacent vegetation communities by burying herbaceous growth and stressing or killing trees by burying surface roots. Some sites require the installation of erosion blankets on slopes over 3:1, particularly if an adequate cover planting cannot be established or the well pad is close to or above a creek, river, or wetland.

During a routine well pad installation, saleable timber would be removed from the site if logs are commercially viable, but otherwise it is cut and left on-site. Vegetation debris piles are stored along the edges of the construction site and may be buried onsite, burned, or left in place after drilling operations are completed. Vegetation debris is not permitted in the reserve pit, as it can disrupt future monitoring.

During interim reclamation, the reserve pit area is graded and the surface is fertilized, seeded, and mulched. Although the operators are encouraged to use native seed, the final mix and tree planting is approved by the private landowner or surface managing agency. By policy, BLM excludes invasive species, although non-native grasses, particularly annual rye, Bahia and Bermuda grass are used to establish a quick cover on disturbed slopes. These sites typically progress through “old field” stage as opportunistic pioneer plant species become established. Within a few years, young sapling pine and hardwoods become established. Faster-growing pines generally dominate the site until gradually overtaken by longer-lived hardwoods. It may take 100 years or more to reestablish hardwood forests with similar structure and even longer before species diversity returns to near pre-disturbance levels.

Surface-disturbing activities have the potential to introduce or promote the spread of invasive, exotic plant species. Impacts are dependent on the species planted during restoration activities and the management of the site during and following restoration. Restoration activities typically include seeding non-native grasses, such as annual rye (during the winter months) and Bahia or Bermuda grass (during the summer months) to provide a quick cover for disturbed soils. Including native species in the mix increases diversity and provides a more natural structure. If these areas are mowed following abandonment, these non-native grasses are expected to persist and dominate the site; however, if the sites are replanted in pine or left unmowed, the areas can be expected to progress through old field type growth which is dominated by opportunistic native and non-native species alike. Ultimately, both Bahia and Bermuda grass are expected to become shaded out as a tree or heavy shrub layer becomes established. Japanese honeysuckle and Chinese privet can both persist in shaded situations.

Throughout the State, some plant communities, embedded in the larger forested landscape, are particularly sensitive to disruption and are difficult to restore after surface-disturbing activities. Many of these are restricted to a narrow range of soil types such as glades and prairies; others are sensitive to changes in hydrography, such as bogs, forested wetlands, and seepage slope communities. Construction activities in these plant communities generally alter the site sufficiently to preclude the reestablishment of these communities in the foreseeable future. Also, because of the limited acreage of these vegetation communities, loss of even the small acreages from BLM-permitted oil and gas activities has a disproportionate effect on the plant diversity in an area.

Impacts from Recreation and Travel Management Actions

The coastal dune habitat associated with the Fort Morgan Beach and Highway tracts could experience localized vegetation damage as a result of public foot traffic at traditional beach access points at Veterans Road and Mobile Road. Repetitive use erodes the dunes and keeps dune vegetation from becoming established, excluding use by Alabama beach mouse.

At the Coosa River, Fowl River, and Geneva tracts, which contain sensitive wetland and riverine habitat. Dispersed recreational use is primarily boat related and is not expected to have substantial impacts on vegetation. Heavier recreation use on the southern portion of the Jordan Lake tract occurs as a result of the adjacent camps and keeps shrubs and forbs from establishing a natural riparian zone along this portion of Jordon Lake.

Impacts from Lands and Realty Management Actions

New ROWs for access roads and utilities could occur on the Fort Morgan Highway or Beach tracts, where new disturbance is likely to total less than an acre. This is most likely to occur in upland scrub or flatwood communities. In addition, maintenance activities in existing ROW are likely to keep native plant communities from establishing a shrub or tree component and would foster the spread of invasive, exotic plant species, particularly cogon grass and Chinese tallow, both of which occur on or near the BLM highway tracts.

Fish and Wildlife

Impacts from Vegetative Communities Management Actions

No vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could result in habitat degradation on any of the BLM surface tracts. The maritime forests, scrubs, and flatwoods on the Fort

Morgan Highway tracts are particularly vulnerable to cogon grass and Chinese tallow. Cogon grass could displace native grasses and forbs that provide foraging habitat for migratory and resident birds and would increase susceptibility of coastal scrub habitats to wildfire.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under impacts from vegetative communities management actions.

Impacts from Minerals Management Actions

Oil and gas development on non-USFS FMO is expected to result in the disturbance of 105 acres. Impacts would include the direct loss of habitat from the construction of drilling pads, production facilities, pipelines and roads, from degradation of nearby aquatic or wetland habitats through sedimentation or changes in hydrology, and from the surface discharge of water produced from coalbed methane wells. These impacts could occur in any of the oil and gas potential areas in the State, but have in the past been concentrated in Jefferson and Walker Counties in the Black Warrior River Basin. Wherever wells are constructed, impacts to general wildlife are dependent on the well pad location, design, and need for additional access roads.

Impacts to many wildlife species from oil and gas development are localized and temporary. Most common game species and other mobile wildlife species avoid the well pad areas during construction. Less mobile species are directly impacted and during the spring and early summer; this can include nesting neotropical birds. Habitat generalists, including most game species, tend to return to surrounding habitats after the well is completed and construction activities have ceased; however, construction in high-value habitats or in areas with more narrowly adapted wildlife species can alter the overall species diversity. Wells and roads in areas of contiguous forests increase habitat fragmentation, reducing the suitability of the area for interior nesting birds and making nests more susceptible to predation and parasitism. Older-growth forests which provide habitat for interior forest nesting birds and a wider diversity of amphibians and reptiles are often located in riparian/wetland zones left as buffers during logging operations or in steeper, less accessible slopes.

Oil and gas drilling continues for 24 hours a day until the well is completed. During this time most wildlife, including waterfowl and many song-birds, are expected to avoid the immediate area; however, once drilling is completed, reserve pits with water can become a hazard for waterfowl and other birds which can become soiled by drilling fluids. If the well is put into production, there is documentation that birds and bats may use open vent stacks for roosting or perching. Once in these stacks, animals can become trapped or asphyxiated. While much of the work documenting this problem has occurred in western States, the situation in Alabama is expected to be similar.

Access roads and well pads can alter the local hydrography and reduce surface flow to mesic areas and divert or degrade surface water supporting wetland habitats. Installation of culverts and diversion of existing drainages around well pads help maintain existing hydrologic systems, but the disturbance causes local sedimentation and can retard sheet flow to wetland habitats. Amphibians and many reptiles associated with wetland communities are vulnerable to disturbance, as they are not highly mobile and tend to have narrow habitat requirements.

For impacts from disposal of coal-bed methane produced waters see the special status species discussion.

Impacts from Recreation and Travel Management Actions

The coastal dune habitat associated with the Fort Morgan Beach and Highway tracts could experience localized vegetation damage and habitat loss as a result of frequent dispersed recreation use and lack of active recreation management. Noise and human presence associated with beach recreation could displace foraging shore-birds and result in reduced nesting efforts or success by beach nesting birds. Dispersed recreation use currently occurs on the Coosa River, Fowl River, and Geneva tracts, which contain sensitive wetland and riverine habitat. If recreation use became more frequent on these tracts in the long term, species susceptible to disturbance could be affected (such as freshwater snails, mussels, turtles, amphibians, migratory and shore-birds, and nesting species, as well as terrestrial wildlife, avifauna, and aquatic species). Recreational fishing on the Jordan Lake tract could result in surface disturbance resulting in damage to riparian/wetland areas and trampling of the understory that could further disturb riparian/wetland and aquatic species in the adjacent river.

Impacts from Lands and Realty Management Actions

New or expanded ROW on the Fort Morgan Highway tracts are anticipated to result in less than an acre of new disturbance. This acreage is expected to be near or on existing maintained ROW, and is likely to occur in coastal scrub habitats. This activity could be particularly disruptive during spring and fall migrations, when this narrow band of vegetation can support high numbers of migrating song-birds.

Special Status Species

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could increase the potential for exotic, invasive species to become established or spread on BLM surface tracts. Cogon grass at the Fort Morgan Highway tracts, in particular, has the potential to alter Alabama beach mouse critical habitat as it forms dense stands displacing native herbaceous plants and potentially increasing fire frequency and intensity.

Under this alternative, BLM would not actively promote the restoration of coastal dunes following damage by major storm events, which would promote sand deposition and facilitate the return of habitat conditions suitable for Alabama beach mouse.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under impacts from vegetative communities management actions.

Impacts from Minerals Management Actions

Oil and gas development on non-USFS FMO in Alabama is expected to result in the disturbance of 105 acres, any of which could occur in habitats supporting special status species. Historically, oil and gas drilling on non-USFS FMO has occurred in the Black Warrior River Basin, but drilling on non-USFS FMO could occur anywhere in the State (outside of the ten southeastern counties that do not contain non-USFS FMO). Development interests are prompted by new oil and gas finds in the State, improvements in drilling and extraction technologies, and high prices. Because of this, there is some potential to impact almost any of the special status species in the State. Impacts to special status species could include the direct loss of habitat from the construction of drilling pads, production facilities, pipelines and roads, from degradation of nearby aquatic or wetland habitats through contamination, sedimentation or changes in hydrology, and from the surface discharge of water produced from coalbed methane wells. The following discussion focuses on the potential for these activities to affect habitats that support the majority of the State's special status species. In addition, individual species with established management guidelines, such as gopher tortoise, red-cockaded woodpecker, and bald eagle are also discussed. No development is anticipated on the BLM surface tracts, many of which support Federally-listed species and contain designated critical habitat; however, the non-USFS FMO under those tracts could be developed through directional drilling.

Given the high number and wide distribution of special status species in aquatic and wetland habitats in Alabama, all oil and gas activity near rivers, creeks, or wetland habitats has a high potential of affecting special status species in the immediate area or downstream of the disturbance. Impacts to aquatic and wetland habitats would occur through degradation of water quality through increased sedimentation or turbidity, contamination, direct loss of habitat, and changes in local hydrography. Disposal of water produced by coal-bed methane wells in the Black Warrior River basin also has the potential to affect special status species by increasing salinity and introducing other contaminants. Some special status species cannot tolerate increases in human activity, and could be impacted directly by increases in vehicle activity and construction activities.

Sedimentation and increased turbidity are a current threat to most of Alabama's mussels and special status fish species. Increases in sedimentation to streams and wetlands by oil and gas development are a factor of well pad design, erodibility of the soils, proximity of the disturbance, slope, and the intervening vegetation. The potential for sedimentation increases with prolonged or heavy rains that are typical in this area. Before protective plant covers have been established cut and fill slopes are particularly vulnerable to erosion. Intact vegetation along riparian/wetland zones and around wetlands can substantially buffer these areas. Research has shown that a minimum of a thirty-foot buffer of vegetation is needed to control sediments and maintain stream temperature; however, 100-foot buffers may be needed to protect stream invertebrates, and 1,000-feet or more may be needed to protect some amphibians, reptiles, and forest-interior birds (Wenger 1999). Sediments deposited in intermittent drainages and headwater streams would be transported downstream during periods of high water, increasing turbidity and burying aquatic invertebrates in higher order streams.

Filling wetlands, including bogs, seepage slopes, wet flatwoods, and forested swamps generally alters the site sufficiently to preclude the reestablishment of these communities in the foreseeable future, and could result in direct habitat loss for a wide variety of special status species which use these habitats. Because so many of these species have limited ranges, the list of species potentially affected would vary by location. Generally, because of the limited acreage of these vegetation communities, loss from even the small amount of disturbance associated with BLM-permitted oil and gas activities has the potential to destroy or degrade habitat for special status species. For instance, there are up to 12 special status crayfish across the State that are vulnerable to habitat disturbance in bogs and wet flatwoods. Henslow's sparrow wintering habitat and breeding habitat for Bachman's sparrow could be lost by construction in or near grassy bogs or wet flatwoods. Construction activities, and particularly linear disturbances related to new roads and pipelines, can disrupt the local hydrography supporting seepage slopes or sheet flow to bogs and swamps degrading these habitats.

In the Black Warrior River Basin, water produced from coal-bed methane wells is typically disposed of through surface discharge. The chemical makeup of produced waters can vary by well with salinity, measured as TDS, being the most limiting factor. TDS in the Black Warrior Basin varies from less than 1,000 mg/L to more than 43,000 mg/L (U. S. Department of Energy 2003). Produced water is stored in ponds to precipitate out metals and to lower pH prior to discharge. NPDES permits issued by the State limit in-stream TDS concentrations to 230 mg/L. This threshold is approved by the Environmental Protection Agency (EPA) for general wildlife habitat and is met by discharging into rivers with sufficient flow to dilute and meet the in-stream thresholds. NPDES permits require monitoring of pH, iron, manganese, biochemical oxygen demand, oil and grease, and dissolved oxygen; additional monitoring requirements for conductivity, chlorides, and effluent toxicity are included. Dischargers are required to install a diffuser on the end of their discharge pipes to minimize scouring and are required to implement a BMP plan. Other elements, such as trace amounts of metals, are not routinely monitored under NPDES permits. Thresholds for most mussels have not been studied and there is concern that the existing thresholds may not be sufficient to protect these bottom dwelling species.

Karst formations support cave habitats with high numbers of special status species, including many endemic crayfish, salamanders, and bats and are particularly sensitive to oil and gas development. In caves, even minor alterations in temperature, humidity, and water quality or quantity can result in irreversible impacts. Caves by their nature are isolated and support highly endemic faunas often with extremely narrow habitat requirements. Wells drilled through cave/karst resources can result in contaminants, such as drilling fluids and cements, draining into the cave/karst system. Karst habitats can be degraded by hydrocarbons from spills or leaks from well casings, storage tanks, reserve pits, pipelines, and production facilities that may enter into the cave/karst systems. Additionally, cementing operations could affect portions of underground drainage systems by restricting groundwater flow and introducing pollutants into karst systems. Other possible impacts are vented or escaped gases collecting in sinkholes and caves. These gases can cause a die-off of plant and animal life that use the special habitat created by the microclimate of the cave entrances or sinkhole.

Along the Alabama coast, there are 365 acres of non-USFS FMO within the designated critical habitat for Alabama beach mouse. Portions of this acreage also contain coastal beaches used by nesting loggerhead sea turtles and potentially by green sea turtle and Kemp’s Ridley sea turtle, as well as piping plover, snowy plover, and Wilson’s plover. Any disturbance of the surface from oil and gas development in this area is likely to adversely affect Federally-listed species. Section 7 consultations with the U. S. Fish and Wildlife Service (USFWS) would be required prior to BLM permitting any action that could adversely affect these Federally-listed species or designated habitat. Subsequent actions would comply with the conditions established by any subsequent biological opinions (BOs). Although it is unlikely that oil and gas development would occur on the BLM surface tracts, non-USFS FMO could be used to consolidate acreage to meet State spacing requirements, prompting oil and gas activity in suitable or occupied habitat Alabama beach mouse and nesting sea turtle habitat.

In the coastal plain areas, gopher tortoise could be affected by oil and gas activity in upland habitats. Tortoises could be impacted by the loss or damage to burrows, destruction of foraging habitat, and tortoises could be killed during construction or by service vehicles. Construction activities and roads within 600-feet of burrows could isolate individuals and reduce reproductive potential within a population. In many cases, the presence of gopher tortoises indicates that habitat is suitable for a host of species associated with dry longleaf pine forests, including the black pine snake (*Pituophis melanoleucus lodingi*).

Red-cockaded woodpecker could be affected by oil and gas development on 888 acres of non-USFS FMO. Red-cockaded woodpeckers could be affected by the loss of nesting habitat within existing clusters and the loss of current or potential foraging habitat within 0.5 miles of existing clusters, particularly on non-USFS FMO near the Talladega and Conecuh National Forests, which support most of the State's population.

Throughout the State, breeding and wintering bald eagles could be affected by drilling near large rivers or reservoirs. Bald eagles are particularly sensitive when courting, nesting, and fledging young. In Alabama this typically occurs between December 1 and August 1. Construction activities within 1.5 miles of nest sites could result in nest abandonment depending on factors such as visibility and tolerance of individual pairs.

Impacts from Recreation and Travel Management Actions

The coastal dune habitat associated with the Fort Morgan Beach tracts would continue to be trampled at traditional beach access points as Veterans Road and Mobile Street, damaging habitat for the Alabama beach mouse. Recreational use can flush foraging shore-birds and result in reduced nesting efforts or success by beach-nesting birds. Unmanaged recreational use of beaches could also hamper or deter nesting attempts by sea turtles and interfere with incubating egg clutches and the sea approach of hatchlings (National Marine Fisheries Service and USFWS 1991). The Fort Morgan Highway tracts, also designated as critical habitat, could experience loss or damage to vegetation as a result of continuing to be managed as open to recreation use. Dispersed recreation use of the Coosa River tracts has the potential to cause bald eagles to abandon nest sites.

Impacts from Lands and Realty Management Actions

New ROWs for access roads and utilities could occur on the Fort Morgan Highway or Beach tracts, where new disturbance is likely to total less than an acre. These tracts are designated critical habitat for Alabama beach mouse. Any surface disturbance, mowing, or other vegetation management activities could adversely affect the Alabama beach mouse, destroying burrows or removing plants that could provide a seed source. Because these tracts are within designated critical habitat for Alabama beach mouse, plantings to stabilize disturbed soils would be limited to locally occurring native species.

Wildland Fire Ecology and Management

Suppressing all wildland fires, unless an in-place site-specific plan determines otherwise, would minimize immediate threats and damage to life, public safety, and developments in the wildland-urban interface (WUI) and to natural resource values. Allowing prescribed burning on a case-by-case basis would allow for a reduction in hazardous fuel conditions, improving ability to suppress wildfires while maintaining disturbance levels to which vegetation communities have adapted. Fire response and fuels treatments would apply to the 159 acres of BLM-administered surface land.

Impacts from Vegetative Communities Management Actions

Although no specific vegetative communities actions are proposed, allowing vegetation manipulation to meet resources objectives under standard management common to all alternatives would serve to decrease vegetation density and cover (fuel load) and maintain natural fuel conditions across the surface tracts. This would maintain natural disturbance regimes which would be easier to manage through prescribed fire or other treatments. This would also decrease the frequency and intensity of wildland fires and allow fires to be more easily controlled, better protecting life, public safety, and property and resource values. However, lack of specific areas and species being managed could result in invasions and fuel accumulations that would increase the frequency and intensity of wildland fires.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would result in similar impacts as discussed under impacts from vegetative communities management actions.

Impacts from Minerals Management Actions

Minerals development activities would introduce additional ignition sources throughout the non-USFS FMO, increasing the potential of wildland fire occurrence. Disturbance of 105 acres associated with the development of 20 wells on non-USFS FMO could provide increased accessibility for fire suppression equipment, and provide fuel breaks in the case of wildland fire events. In addition, the infrastructure associated with the 20 new wells would require protection in wildland fire events. Impacts from mineral development activities would not occur on the 8,179 acres closed to oil and gas development.

Impacts from Recreation and Travel Management Actions

Continuing to manage the surface tracts as open to recreation use would allow for dispersed recreation use, which could introduce additional ignition sources and increase the probability of wildland fire occurrence. This would be more prevalent in areas that are more accessible.

Impacts from Lands and Realty Management Actions

Development of above-ground ROWs on the surface tracts, which would be managed as open to ROW development, would require additional efforts by firefighters to protect these areas in wildland fire events. Development of ROWs would also result in clearing vegetation to make way for linear features such as roads, pipelines, and transmission lines. ROWs could provide fuel breaks, which could help prevent the spread of wildland fires. ROWs could also provide firefighters with increased accessibility for fire suppression equipment. While more ROWs could increase suppression costs, the aspects of ROW development related to vegetation clearing and the potential for increased accessibility could reduce suppression costs.

Cultural Resources

Management of cultural resources provides protection from the potentially damaging effects of surface-disturbing activities through implementation of existing laws and policy, such as Section 106 of the National Historic Preservation Act (NHPA) and the Federal Lands Policy and Management Act of 1976 (FLPMA). Federal undertakings typically require cultural resource inventories that would result in the identification of cultural resource sites and determination of eligibility to the National Register of Historic Places (NRHP). The cultural resources data acquired through inventories and evaluations would increase knowledge of cultural resources on BLM-administered lands and minerals in the State. Following site-specific inventories, mitigation measures would be prescribed as necessary for eligible properties. Any cultural sites discovered may be considered for further evaluation to assess its eligibility for listing on the NRHP. Through this process, significant impacts on cultural sites eligible for the NRHP would be avoided or mitigated. Avoidance is BLM’s preferred measure to eliminate potential adverse effects. Avoidance preserves the cultural resource in place. If this is not possible under reasonable circumstances, scientifically valid excavation and data recovery is an alternative mitigation method. Scientifically valid excavation would be used as a final measure, and the extent of excavation would be determined through BLM consultation with the State Historic Preservation Officer (SHPO) and Tribes.

Data recovery preserves as much of the cultural record as possible through archaeological methods. Any mitigation effort requiring archaeological data recovery is subject to the terms outlined in a Data Recovery Plan and documented through a signed Memorandum of Understanding (MOU) with the SHPO, tribes, and other consulting parties. While data recovery preserves as much data as possible, the excavated portions of the property would be lost or damaged. Removing cultural resources from a site using current scientific methods also reduces future scientific value if more accurate methods of analysis are developed. Mitigation through data recovery also reduces or eliminates other uses of cultural resources sites, such as traditional, public, conservation, or experimental use. The inventory and avoidance procedures conducted in conjunction with surface-disturbing actions would protect most cultural resources from significant impacts.

Despite the best efforts to identify all cultural resources, there remains a potential for inadvertent impacts to previously undiscovered sites, especially buried sites with no surface indications. Following discovery of cultural resources, activities would stop to allow for mitigation to minimize further damage to cultural resources. There is a set process through Section 106 for identifying, evaluating, and treating the effects of inadvertent discoveries to reduce potential impacts from these discoveries.

Wildfire and prescribed fire could impact cultural resource sites, including the eligibility characteristics of sites that are listed or eligible for listing on the NRHP. Impacts would be limited to the Coosa River tracts, as the Geneva tract contains small amounts of vegetation that maintains foliage yearlong. The other tracts have been inventoried for cultural resources and no sites were identified.

Prehistoric and historic resources potentially affected by wildfire may be inorganic or organic. Generally speaking, organic materials are more at risk as they tend to burn or alter at lower temperatures than inorganic materials. Wildfire impacts on inorganic cultural resources include fracturing, shattering, and changes in color and internal luster, which might reduce an artifact’s ability to render information about the past. As a general rule, fire would not affect buried cultural materials. Studies show that even a few centimeters of soil cover (four inches) are sufficient to protect cultural materials (Oster N.D.). Wildfires that burn hot and fast through a site may have less of an effect on certain types of cultural materials than fires that smolder in the duff or burn for a long time period, allowing heat from the fire to penetrate the surface. In addition, heat from wildland fires could change the physical nature of the ground, making it harder to identify cultural resources. The isolated nature of vegetation on the Coosa River tracts would limit the potential for ignition or spread of wildland fire, and decrease the potential impacts to cultural resources.

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would require cultural resource clearances before any activities were to occur; therefore, impacts would not be anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would require cultural resource clearances before any activities were to occur; therefore, impacts would not be anticipated.

Impacts from Minerals Management Actions

Cultural resources on 305,640 acres of non-USFS FMO in Alabama managed as open to leasing subject to standard lease terms and conditions could be impacted by oil and gas development. Based on the RFD, oil and gas developments within these areas would impact 105 acres through the development of 20 wells over 20 years. Development on these acres would typically be subject to Class III cultural resource inventories and evaluation on a project-by-project basis prior to allowing disturbance. This would result in the identification and potential excavation of cultural sites. Cultural sites on 8,179 acres closed to leasing would be protected from oil and gas development.

Sixty-eight known cultural resources sites exist within non-USFS FMO in the coal potential area and 66 known sites are within one-half mile of the tracts. Based on the RFD, production of 37.6 million tons of coal from pre-existing underground mines over 20 years would not result in new surface disturbance; therefore, no impacts to cultural resources would be anticipated from coal development.

Impacts from Recreation and Travel Management Actions

Recreation activities on the surface tracts could result in inadvertent damage and vandalism to cultural sites on tracts that contain cultural resources. Although the tracts are not anticipated to be used extensively for recreation, many surface tracts are located in rivers, wetlands, and beach areas that are desirable locations for recreation and there is a high potential for cultural resources to be found. Impacts from travel management actions would not be anticipated, because the Coosa River and Geneva tracts that have not been surveyed for cultural resources are only accessible by boat and no cultural resources were found on all other tracts have been surveyed.

Impacts from Lands and Realty Management Actions

Ground-disturbing activities associated with ROW construction and maintenance could impact cultural resources. If a permitted ROW for an access road, utility tower, or bridge pier were approved on a surface tract, an appropriate level of cultural resource survey would need to be conducted. Approved activities in areas not previously surveyed would be subject to a ground survey and consultation requirements with the SHPO under NHPA Section 106 regulations prior to construction.

A cultural resource survey would also be required if existing ROWs on the Fort Morgan Highway and Jordan Lake tracts were expanded or modified. Construction projects could result in inadvertent damage if cultural resources that were undetected during surveys were unearthed during ground-disturbing activities. Following discovery of cultural resources, activities would stop in accordance with the ROW grant which would minimize further damage to cultural resources. Therefore, impacts to cultural resources would be anticipated to be minimal.

Visual Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to visual quality. Although visual quality would deteriorate in the short term, visual quality would improve in the long term once vegetation has reestablished to meet VRM class objectives.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to visual quality. Although visual quality would deteriorate in the short term, visual quality would improve in the long term once vegetation has reestablished to meet VRM class objectives.

Impacts from Minerals Management Actions

Mineral exploration and development on non-USFS FMO tracts (313,819 acres) would result in impacts to visual resources on 105 acres from 20 wells. Removal of vegetation and construction of wells and well pads and introduction of other equipment would decrease visual quality. BLM doesn’t manage the surface for non-USFS FMO tracts; however, BLM can place COAs or best practices to minimize impacts to visual resources as needed. Impacts would not be anticipated on the 8,179 non-USFS FMO acres closed to leasing. Since no mineral development activities would occur on the surface tracts, there would be no violations of VRM class objectives.

Impacts from Recreation and Travel Management Actions

Allowing recreation activities and motorized vehicle use on the surface tracts could result in decreased visual quality over time from changes to existing natural or manmade landforms and scenic vistas through vegetation and soil loss, particularly on tracts that are in undeveloped areas. Since the surface tracts are not anticipated to be used extensively for recreation and travel, these impacts would be minimal.

Impacts from Lands and Realty Management Actions

If the existing ROWs that bisect the Fort Morgan Highway and Jordan Lake tracts were expanded or otherwise modified, visual quality would be diminished. No existing utility and road ROWs exist on the Coosa River, Fort Morgan Beach, Geneva, and Fowl River tracts. If a new road or utility ROW were authorized on these tracts, visual quality would be diminished if the ROW were to dominate the view of the casual observer.

Minerals

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Minerals Management Actions

Under this alternative, 305,640 non-USFS FMO acres would be open to leasing, subject to standard lease terms and conditions; 8,179 non-USFS FMO acres would be closed to leasing due to restrictions placed by other Federal surface management agencies. No impacts to oil and gas minerals exploration and development would be anticipated from management of non-USFS FMO tracts.

No impacts to coal leasing and development in the Warrior Basin would be anticipated. Coal production would continue at historical rates.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Lands and Realty Management Actions

Lands and realty management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated. BLM would only dispose of non-USFS FMO with no suspected value and, therefore, there would be no loss of opportunity.

Recreation and Travel Management

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to recreation. Recreationists could be displaced from vegetation treatment areas until revegetation occurs; however, the vegetation treatments would benefit recreationists by improving the long-term aesthetics of an area.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground disturbing activities of a severity or extent that result in impacts to recreation. Recreationists could be displaced from protected areas or treated areas until revegetation occurs; however, the habitat improvements and protections would benefit recreationists by improving the long term aesthetics and wildlife viewing of an area.

Impacts from Minerals Management Actions

Oil and gas development on non-USFS FMO tracts with surface management by other Federal agencies that are open to the public for recreation, as identified in Table 3-17, could be affected by the leasing of Federal minerals by BLM. Those areas or installations not open to recreation or leasing would not be affected, including National Park Service (NPS) and USFWS lands. Oil and gas development could provide additional opportunities for travel due to the construction of access roads.

Since approximately 105 acres of vegetation removal and construction activities would result from the development of 20 oil and gas wells on non-USFS FMO there could be a decrease in nature-based recreational opportunities due to conflicts with the developments or in areas where the public were excluded. Mineral leasing in recreational areas could result in the removal of vegetation; construction of access roads, well pads, and other infrastructure; introduction of drilling equipment; and associated noise and dust emissions. Effects would include a less-enjoyable recreational environment, though travel management opportunities could improve due to the construction of access roads. Stipulations applied under this alternative by other surface managing agencies could indirectly protect the recreational resources in areas where development would be precluded (8,179 acres).

Since future coal development is anticipated to occur at underground sites without additional infrastructure, additional impacts to recreation would not be anticipated.

Impacts from Recreation and Travel Management Actions

Allowing recreation activities and motorized vehicle use on the surface tracts would maintain existing recreation and travel opportunities. Allowing motorized travel uses on all surface tracts could result in conflicts between motorized recreationists and recreationists seeking a more natural setting or experience.

Impacts from Lands and Realty Management Actions

Although Lots 73 and 74 of the Fort Morgan Beach tracts would be transferred to the USFWS, these lots would remain within the boundaries of the Bon Secour National Wildlife Refuge (NWR) (where they are currently, but are not managed by the USFWS). After transfer, these lots would be managed according to their Comprehensive Conservation Plan. Since all surface tracts would remain in Federal ownership, access to recreation activity in a generally undeveloped setting would be maintained.

If existing utility and road ROWs that bisect the Fort Morgan Highway and Jordan Lake tracts were expanded or otherwise modified, the recreation experience could be diminished as a result of construction activity, ground disturbance, and introduction of new infrastructure. No existing utility and road ROWs exist on the Coosa River, Fort Morgan Beach, Geneva, and Fowl River tracts. If a new road or utility ROW were authorized on these tracts, the recreation experience could be diminished as a result of construction activity, ground disturbance, and introduction of new infrastructure. These actions could provide additional opportunities for travel due to the construction of access roads.

Lands and Realty

Lands and realty is a resource use rather than an environmental component and impacts on lands and realty are a direct result of their management. Therefore, the following discussion is limited to impacts from lands and realty management actions for the 159 acres of BLM-administered surface ownership in Alabama. Impacts from disposal of FMO is discussed under impacts to Minerals from Lands and Realty actions.

Under Alternative 1, all 159 acres of the surface tracts in Alabama would remain open to ROW applications; therefore, no impacts would be anticipated to lands and realty actions. Retaining the surface tracts under BLM administration would not allow for opportunities for other Federal agency or non-Federal ownership. Transferring Lots 73 and 74 of the Fort Morgan Beach tracts to the USFWS as part of the Bon Secour NWR would facilitate Federal management of the lots.

Social and Economic

Definitions and descriptions of potential Environmental Justice populations, including low income and ethnicity statistics were provided in Section 3.2.13. Since this four-county study area where mineral development is anticipated does not encompass Environmental Justice populations as defined, there would likely be no disproportionate effect on those populations under each alternative. Since the specific location of the oil and gas development is yet to be determined, Environmental Justice population locations should be further considered at the implementation level to minimize the potential for disproportionate impacts to Environmental Justice populations and to identify any possible mitigation measures that may be required to reduce impacts (for example, dust, noise, traffic, ground water quality) to these populations.

Impacts from Vegetative Communities Management Actions

Impacts to social and economic conditions would not be anticipated from vegetative communities management actions, since no actions are proposed under this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would not be anticipated to be of an extent that would result in impacts to economic or social conditions.

Impacts from Fish and Wildlife Habitat Management Actions

Impacts to social and economic conditions would not be anticipated from fish and wildlife habitat management actions, since no actions are proposed under this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to economic or social conditions.

Impacts from Minerals Management Actions

Since only 20 fluid mineral wells would likely be drilled with standard lease terms and conditions over the next 20-years, there would be minimal economic impacts from these activities. This type of BLM mineral development is consistent with the development that occurred in the past, including 17 applications for permits to drill between 1983 and 2004. Therefore, there would be minimal changes. The potential minimal changes include a slight increase in employment or income. Social indicators such as housing, education, and cost of living would not be anticipated to change under this alternative from oil and gas activities.

With continued development of oil and gas resources, 105 acres of surface disturbance are anticipated for well pads, roads, and pipeline over the next 20 years. Disturbances from oil and gas development could *potentially* include slight increases in air emissions from construction of well pads and roads, noise from construction activities and trucking, contamination of soils and vegetation, habitat impacts, and groundwater contamination. Stakeholders who believe oil and gas activity should be constrained with conditions and stipulations to protect wetlands and aquatic habitat would likely feel that this alternative does not do enough to ensure protection of these types of resources. Additionally, oil and gas industry stakeholders, as well as others who value maintaining access to Federal minerals for oil and gas development, would likely prefer this alternative over the others.

The anticipated amount of coal to be produced under this alternative for the next 20-years (1.9 millions tons per year) is consistent with coal development over the last 10 years. Currently coal produced from BLM-administered minerals accounts for approximately 10 percent of the total amount of coal produced in the State, 19.5 million tons of coal (Energy Information Agency 1999). In Alabama, mining (non oil and gas) accounts for approximately 6,773 employees and employee compensation of $482,361,000 (Bureau of Economic Analysis [BEA] 2005). If 10 percent of this employment and employee compensation can be attributed to BLM-administered minerals, this activity provides for 677 employees in mining, with total mining employee compensation of $48,236,100. The average annual employee compensation for these workers is $71,218, compared with average annual compensation from all industries in the State of $34,877 (BEA 2005). Mining in the four-county study area where mineral development is possible likely provides fiscal revenues to local and State governments, supporting community and emergency services, school, and infrastructure. Impacts on stakeholder groups from mining activities are likely similar to those stated in the previous paragraph concerning socioeconomic oil and gas impacts. Some stakeholders will support these mining activities due to the economic benefits in income, jobs, and government revenues, while others will be concerned that the economic benefit may not offset the risks to environmental and water resources from the activity.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions would not cause changes in the economic characteristics (employment, income, and industries) or quality of social assets (housing, education, values, and attitudes) in the four-county study area where mineral development is possible as there are no anticipated changes in recreation and travel management actions under this alternative.

Impacts from Lands and Realty Management Actions

All BLM lands under this alternative would remain in Federal ownership. Additionally, new ROW may be developed on the surface tracts. Lands and realty management actions would not cause changes in the economic characteristics (employment, income, and industries) as there are very little changes anticipated under this alternative. Quality of social assets (demographics, housing, cost of living, education) in local communities linked with the remote and scattered BLM surface tracts are not likely to be affected by retaining these lands in Federal ownership. Stakeholders who would like to see these BLM surface tracts sold to either private developers or non-profit organizations for a change in management and use would be adversely impacted by this alternative, while those stakeholders who believe that retention of the Federal lands is important to maintain open space and current management would feel this alternative is consistent with their values.

Hazardous Materials

BLM-authorized activities on surface tracts and non-USFS FMO could include the use of hazardous materials, substances, and waste (including storage, transportation, and spills). Such activities include oil and gas development, coal development, and application of pesticides to improve vegetative communities and wildlife habitat. These activities are conducted in compliance with 29 CFR 1910, 49 CFR 100-185, 40 CFR 100-400, Comprehensive Environmental Response Compensation and Liability Act (CERCLA), Resource Conservation and Recovery Act (RCRA), Superfund Amendment Reauthorization Act (SARA), Toxic Substances Control Act (TSCA), and the Clean Water Act (CWA) and other Federal and State regulations and policies regarding hazardous materials management. Therefore, if a release were to occur, it would be immediately addressed and remediated in accordance with regulation.

4.2.2 Alternative 2

Air Quality

Under this alternative, there is a potential for wildfire which could lead to air emissions. Since all fires would be suppressed, these occurrences would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Vegetative Communities Management Actions

Vegetation treatments, including prescribed fire, and associated use of trucks and heavy equipment would cause short term, localized increases in dust and emissions. Given the small amount and scattered nature of surface ownership, these activities would not be anticipated to individually deteriorate air quality conditions.

Impacts from Fish and Wildlife Habitat Management Actions

Use of trucks and heavy equipment associated with proposed fish and wildlife habitat improvements, such as constructing dune walk-overs on the Fort Morgan Beach tract, and conducting prescribed burns to improve habitat on the Fort Morgan Highway tract would cause short term, localized increases in dust and emissions. Given the small amount and scattered nature of surface ownership, these activities would not be anticipated to individually deteriorate air quality conditions.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas (20 wells over the next 20 years) and coal development (1.9 million tons produced annually over the next 20 years) and associated air emissions would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Motorized travel would be closed or limited to designated routes on all tracts under this alternative. However, the level of activity contributing to emissions and associated air quality impacts would not be anticipated to change compared to Alternative 1 since these tracts are not anticipated to be used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) would be managed as ROW avoidance areas, there would be less potential for emissions associated with the use of trucks and heavy equipment (bulldozers, etc.) for ROW development compared to Alternative 1. Impacts from potential ROW development on the Jordan Lake and Fort Morgan Highway tracts would be the same as Alternative 1.

Soil Resources

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions, such as removing invasive species and conducting prescribed fire, on surface tracts could increase site-specific erosion in the short term. Sand deposition would be facilitated by planting native coastal dune vegetation as part of dune restoration activities after damage by major storms. Over the long term, improving vegetation communities would reduce erosion and overland flows.

Impacts from Fish and Wildlife Habitat Management Actions

Impacts from fish and wildlife habitat management actions would be similar to Alternative 1. In addition, there would be minimal short term soil disturbance from the construction of dune walk-overs on the Fort Morgan Beach tracts and conducting prescribed burns to improve habitat on the Fort Morgan Highway tracts. These soils are not prone to compaction and the construction is not expected to alter the soil horizons in the long term.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated impacts on 105 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, controlled surface use (CSU) (91,702 acres), and no surface occupancy (NSO) (94,589 acres) restrictions would be implemented, which reduces disturbance to soils within the protected areas. Impacts to prime or unique farmlands would be the same as described for Alternative 1.

Impacts from Recreation and Travel Management Actions

Motorized travel would be closed or limited to designated routes on all tracts under this alternative. However, the level of activity that could increase erosion and associated impacts to soils would not be anticipated to change compared to Alternative 1 since these tracts are not anticipated to be used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) would be managed as ROW avoidance areas, there would be less potential for ground disturbance and increased erosion associated with ROW development compared to Alternative 1. Impacts from potential ROW development on the Jordan Lake and Fort Morgan Highway tracts would be the same as Alternative 1.

Water Resources

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions, such as removing invasive species and conducting prescribed fire, on surface tracts would increase site-specific erosion, which increases nutrient levels and turbidity and decreases water quality in the short term. Over the long term, improving vegetation communities would reduce erosion and overland flows.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions, such as constructing dune walk-overs on the Fort Morgan Beach tracts and conducting prescribed burns to improve habitat on the Fort Morgan Highway tracts, could increase erosion and run-off, which increases nutrient levels and turbidity and decreases water quality in the short term. Over the long term, improving and protecting fish and wildlife habitats would reduce erosion and overland flows.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated impacts on 105 acres would be the same as Alternative 1. A 1,000-foot NSO buffer around aquatic habitats and applying the stipulations in Appendix D would increase the area where seasonal, CSU (91,702 acres), and NSO (94,589 acres) restrictions would be implemented, which would reduce disturbance to water resources within the protected areas. This stipulation could be applied to an estimated 90,930 acres or 29 percent of the non-USFS FMO available for leasing in Alabama. This buffer is expected to prevent construction activities from increasing the sedimentation of local drainages and wetlands.

Impacts from coal mining would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Motorized travel would be closed or limited to designated routes on all tracts under this alternative. However, the level of activity that could impact water resources would not be anticipated to change compared to Alternative 1 since these tracts are not anticipated to be used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) would be managed as ROW avoidance areas, there would be less potential for ground disturbance and impacts to water resources associated with ROW development compared to Alternative 1. No coastal wetland habitats or water bodies occur on or adjacent to the Fort Morgan Highway tracts. Development of additional transportation routes and ROWs on the Jordan Lake tract could contribute to the already degrading water quality of the Coosa River, located adjacent to the tract, as well as Jordan Lake, located about 10 miles downstream. Impacts contributing to decreased water quality could result from decreased soil stability and increased surface runoff caused by vegetation-clearing activities and construction ground disturbance.

Vegetative Communities

Impacts from Vegetative Communities Management Actions

Early detection and removal of exotic plant species from the Fowl River and Coosa River tracts would safeguard the wetland emergent vegetation and wet flatwoods communities on this tract. On the Fort Morgan Highway tracts, woody exotic, invasive species such as Chinese tallow and Chinese privet would be removed by hand and stump treated with approved herbicides. Selective hand spraying of Cogon grass may be required where it is established. More active management of vegetation communities would provide better vegetation composition on all surface tracts than under Alternative 1.

Impacts from Fish and Wildlife Habitat Management Actions

For the Fort Morgan Beach tracts, the construction of dune walk-overs would funnel foot traffic across sensitive dune habitats and allow sand to accrete and native dune vegetation to re-establish. On the Fort Morgan Highway tracts, forbs and native grasses would benefit from periodic prescribed burns of wet flatwoods and wetlands conducted in coordination with the Bon Secour NWR.

Impacts from Minerals Management Actions

Impacts to vegetation would be similar to Alternative 1; however, under this alternative oil and gas activities would be excluded from a 1,000-foot buffer around wetlands and aquatic habitats, karst areas, shoreline habitats, and habitats like naturally occurring prairies and glades with special status species. Buffering these areas would provide additional protection for high value plant communities from potential sedimentation or contamination from surface runoff or inadvertent leaching from the reserve pit.

Impacts from Recreation and Travel Management Actions

Impacts from managing the Coosa River, Fort Morgan Highway, Fowl River, and Geneva tracts as open to recreation could result in similar impacts as in Alternative 1. Two dune walk-overs constructed at Veterans Road and Mobile Road would funnel visitors across sensitive dune habitat, allowing dune vegetation to reestablish at these traditional access points. Plantings of native coastal dune vegetation would restore several acres of dunes trampled at these beach access points.

Impacts from Lands and Realty Management Actions

All surface tracts except the Fort Morgan Highway and Jordan Lake tracts would be managed as ROW avoidance areas. No new disturbance would be allowed in the existing ROW corridors on the Fort Morgan Highway tracts; however, maintenance activities would be permitted. These existing utility ROWs have been repeatedly disturbed and maintained in an early seral stage dominated by grasses and herbaceous growth. The continued maintenance of these utility corridors prevents the establishment of the scrub vegetation characteristic of this elevation. In addition, these disturbed sites are prone to the establishment of exotic, invasive plant species, particularly cogon grass and Chinese tallow which are common along the Highway 180 corridor. Cogon grass is very difficult to eradicate, and establishes dense stands that displace native vegetation communities.

Fish and Wildlife

Impacts from Vegetative Communities Management Actions

Dune restoration activities, such as planting sea oats and other dune stabilizing natives at Fort Morgan would benefit a wide variety of shore-birds by providing additional areas for loafing and potential nesting sites. At all sites, wildlife would benefit from removal of exotic invasive plant species. Early detection and removal reduces the overall impact to wildlife species by limiting the amount of change to the habitat structure that can occur when large woody invasives are removed, and by eliminating or reducing the amount of herbicide needed to control herbaceous invasives.

Impacts from Fish and Wildlife Habitat Management Actions

Many of the benefits discussed under the special status species and vegetation impacts sections would also benefit general wildlife values. At the Fort Morgan Beach tracts, dune nesting shore-birds would benefit from actions to enhance and protect coastal dunes. The construction of dune walk-overs on the Fort Morgan Beach tracts would protect sensitive dune habitats from foot traffic and allow additional habitat to develop at these traditional public access points. Shorebirds benefit from funneling foot traffic across these sensitive habitats by reducing human intrusions on loafing and nesting areas. On all tracts, wildlife would benefit from early detection and removal of exotic invasive weed species, which once established can substantially alter habitats.

Impacts from Minerals Management Actions

General impacts to wildlife are expected to be the same as Alternative 1; however, under this alternative oil and gas activities would be excluded from high value wildlife habitats. This includes a 1,000-foot buffer around wetlands and aquatic habitats, avoidance of karst areas, shoreline habitats and habitats like naturally occurring prairies and glades with special status species.

BMPs would be applied under this alternative to reduce potential impacts to bats, song-birds, and waterfowl. Reserve pits still containing water 10 days after a well is completed would be netted to exclude migratory birds. Other approved methods could also be used to exclude birds. Open vent equipment, such as heater-treaters, separators, and dehydration units would be covered with anti-perching cones to exclude cavity nesting birds and bats. Any powerlines would be built using approved raptor safe designs to prevent electrocution.

Impacts from Recreation and Travel Management Actions

Limiting vehicle access to existing roads and authorized ROW would eliminate new use patterns from developing which could degrade habitats on BLM surface tracts. This would particularly benefit the Fort Morgan Beach tracts where even occasional vehicle use would damage dunes and destroy dune stabilizing vegetation.

Impacts from Lands and Realty Management Actions

All surface tracts except the Fort Morgan Highway and Jordan Lake tracts would be managed as ROW avoidance areas. No new disturbance would be allowed in the existing ROW corridors on the Fort Morgan Highway tracts; however, maintenance activities would be permitted. These existing utility ROWs have been repeatedly disturbed and maintained in an early seral stage dominated by grasses and herbaceous growth. The continued maintenance of these utility corridors prevents the establishment of the scrub vegetation characteristic of this elevation. In addition, these disturbed sites are prone to the establishment of exotic, invasive plant species, particularly cogon grass and Chinese tallow which are common along the Highway 180 corridor. Cogon grass is very difficult to eradicate, and establishes dense stands that displace native vegetation communities. Maintenance activities, as well as invasive exotic species in the utility corridors, would deteriorate wildlife habitat.

Special Status Species

Impacts from Vegetative Communities Management Actions

Alabama beach mouse and nesting shore-birds would benefit from plantings of native coastal dune vegetation on the Fort Morgan Beach tracts after damaging storms. These plantings promote sand deposition and help to reestablish the dunes more quickly. On the Fowl River, Coosa River, and Fort Morgan Highway tracts, woody exotic, invasive species such as Chinese tallow and Chinese privet would be removed by hand and stump treated with approved herbicides. Selective hand spraying of herbaceous growth, especially cogon grass, may be required where it has become established. Early detection and control of invasive plant species would reduce the amount of native vegetation displaced and minimize changes to structure that occurs when large amounts of invasive woody material is removed.

Impacts from Fish and Wildlife Habitat Management Actions

Alabama beach mouse and nesting shore-birds at the Fort Morgan Beach tracts would benefit from the installation of two dune walk-overs that would eliminate damaging foot traffic, and allow dunes and vegetation to recover at traditional public access areas at Veterans Road and Mobile Road. Prescribed fire could be used to increase herbaceous species in flatwoods or wetlands on the Fort Morgan highway tracts. These burns would be conducted only in conjunction with prescribed burns on adjacent lands managed by the Bon Secour NWR to benefit endemic species. These actions would improve habitat for special status species.

Impacts from Minerals Management Actions

Although the number of wells (20) and acres disturbed (105) would remain the same under this alternative as compared to Alternative 1, lease stipulations would shift surface-disturbing activities away from sensitive habitats with potential to support special status species. This is accomplished with NSO buffers or seasonal restrictions.

To protect special status species occurring in aquatic or wetland habitats, all oil and gas development activities would be excluded from a 1,000-foot buffer around these habitats. In areas with slopes less than 10 percent, the 1,000-foot buffer could be reduced to a minimum of 100-feet if the adjacent waterway or wetlands have been surveyed and no special status species occur within 100-yards upstream and 300-yards downstream of the site. This stipulation could be applied to an estimated 90,930 acres or 29 percent of the non-USFS FMO available for leasing in Alabama. In most cases, this buffer is expected to prevent construction activities from increasing the sedimentation of local drainages and wetlands.

A 250-foot NSO buffer around known caves, fractures, and sinkholes would reduce the chances of drilling through karst formations, providing protection for cave endemics, such as Alabama cave shrimp, Alabama cave fish, gray myotis, Indiana bat, and others. Some potential remains for inadvertently drilling through unknown karst formations and damaging connected cave habitats through introduction of lost drilling fluids and muds, altering temperature and moisture regimes and modifying the hydrology supporting the karst system. The 3,044 acres of FMO within 0.5 miles of caves known to be occupied by gray myotis or Indiana bat would be excluded from surface occupancy, protecting these species and their habitats from disturbance associated with oil and gas activity.

Under this alternative, the 365 acres of non-USFS FMO associated with suitable and designated critical habitat for the Alabama beach mouse, including upland scrub sites, would be excluded from leasing. This would avoid potential impacts to Alabama beach mouse, nesting sea turtles, piping plover, and other coastal special status species including least tern, American oystercatcher, and Wilson’s plover.

Areas with suitable soils and at least 10 percent open pine forest in southern Alabama counties, including Choctaw, Washington, Mobile, Baldwin, Barbour, Bullock, Butler, Clarke, Crenshaw, Coffee, Conecuh, Covington, Dale, Escambia, Geneva, Henry, Houston, Monroe, Montgomery, Pike, and Wilcox counties would require a survey for gopher tortoises prior to any surface-disturbing activities. No disturbance would be permitted within 600-feet of a gopher tortoise burrow. This buffer is expected to protect any breeding populations of gopher tortoise and maintain habitat for associated species including black pine snake. It would also protect habitat values in areas suitable for eastern indigo snake.

Under this alternative, NSO would be permitted within 0.5 miles of a red-cockaded woodpecker cluster. This stipulation would be applied to 888 acres of FMO within known clusters, and would be applied as needed to potential or occupied habitat identified during site assessments conducted prior to leasing. This buffer is expected to contain all foraging habitat required to maintain the red-cockaded woodpecker cluster. There are options for oil and gas activity to occur within suitable foraging habitat, if the foraging requirements for the cluster are met elsewhere, for example clusters maintained on National Forests. This exception would require a concurrence from the USFWS and the State of Alabama. A concurrence would cause disturbance within the suitable foraging habitat, but if granted would not be anticipated to affect local populations.

Under this alternative, NSO would be permitted within 1,500-feet of a bald eagle nest and/or communal roost site, and no surface-disturbing activities would be permitted within 1.5 mile of bald eagle nests during the nesting season from December 1 through August 1. This stipulation is expected to avoid potential impacts to bald eagles. This buffer may be modified as needed in the future to comply with the most current Federal guidelines. The no surface occupancy stipulation could apply to an estimated 30 acres of FMO within 1,500 feet of known bald eagle nests, and the seasonal restriction would apply to an estimated 848 acres of FMO within 1.5 miles of known bald eagle nests. These stipulations could be applied to additional acreage, if new nests or communal roosts are identified during site assessments conducted prior to leasing.

Leases containing potential habitat for specials status plant species, including Federally-listed and candidate species, as well as those ranked as critically imperiled (S-1) and imperiled (S-2) by the Alabama Natural Heritage Program (ANHP) would require botanical surveys prior to surface-disturbing activities. Operations would be excluded from areas supporting these special status plant species. This stipulation is expected to protect most naturally occurring glades, prairies, and other habitats which support special status plant species. This stipulation is estimated to apply to 103 acres of FMO. This is based on known occurrences of special status plants on FMO, and because most of the private land overlaying FMO has not been inventoried for special status plants, this stipulation is expected to be applied more broadly at the lease stage based on site assessments conducted prior to leasing.

Impacts from Recreation and Travel Management Actions

Closing tracts to motorized use or restricting public vehicle use to designated roads and authorized ROWs (depending on tract) would prevent habitat damage to occupied Alabama beach mouse habitat, as well as sea turtle nesting habitat and important shore bird loafing and foraging areas. These closures or restrictions would be consistent with Florida Department of Environmental Management requirements that requires permits for use of vehicles on State beaches, and would allow BLM to sign and more effectively enforce vehicle closures and restrictions.

Impacts from Lands and Realty Management Actions

Under this alternative, two Fort Morgan Beach tract lots (Lots 73 and 74) would be transferred to USFWS for inclusion in the Bon Secour NWR. No new disturbance would be allowed for ROWs on BLM surface tracts. This would include the existing ROW corridors on the Fort Morgan Highway tracts, which are designated as critical habitat for Alabama beach mouse, although maintenance of these existing ROWs would be permitted. The existing utility ROWs on the Fort Morgan Beach tracts have been repeatedly disturbed and maintained in an early seral stage dominated by grasses and herbaceous growth. The continued maintenance of these utility corridors prevents the establishment of the scrub vegetation characteristic of this elevation. In addition, these disturbed sites are prone to the establishment of exotic, invasive plant species, particularly cogon grass and Chinese tallow which are common along the Highway 180 corridor. Cogon grass is very difficult to eradicate and establishes dense stands that displace native vegetation communities. Maintenance activities may introduce additional invasive exotic species in the utility corridors, which would adversely affect Alabama beach mouse critical habitat. Additional work may be needed to assess the role modified areas play in Alabama beach mouse habitat and to determine BMPs regarding the maintenance of this ROW corridor.

Wildland Fire Ecology and Management

Impacts from suppressing all wildland fires and allowing prescribed burning on a case-by-case basis would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions, such as removing invasive species and conducting prescribed fire, on surface tracts would reduce the potential for changes in the vegetation communities from invasive species. As a result, the natural fire regimes would be maintained or restored. This would improve the ability to manage wildland fire in its natural role through application of prescribed fires.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions, such as conducting prescribed burns to improve habitat, would reduce the potential for changes in the vegetation communities from invasive species. Treatments to improve habitat conditions would maintain or restore natural fire regimes through removal of decadent vegetation or invasive species. This would improve the ability to manage wildland fire in its natural role through application of prescribed fires.

Impacts from Minerals Management Actions

Impacts to wildland fire ecology and management from anticipated oil and gas development and associated disturbance of 105 acres would be the same as Alternative 1; however, impacts would not occur on the closed (8,297 acres) and NSO (94,589 acres) areas created through applying the stipulations in Appendix D.

Impacts from Recreation and Travel Management Actions

The potential for increased wildland fire occurrence would decrease compared to Alternative 1 because travel on the surface tracts would be designated as closed or limited to designated routes. This would decrease the ease of accessibility to these areas and reduce the potential for additional ignition sources through increased human use.

Impacts from Lands and Realty Management Actions

Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts would be managed as avoidance areas (a total of 114 acres or 71 percent BLM surface ownership in Alabama), there would be less potential for wildfire impacts associated with ROW development compared to Alternative 1. This would also decrease infrastructure needing protection, but would also decrease improvements in accessibility to fires and providing fire-breaks on these tracts. Impacts from potential ROW development on the Jordan Lake and Fort Morgan Highway tracts would be the same as Alternative 1.

Cultural Resources

Impacts from cultural resources management and wildland fire management actions would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions, such as removing invasive species and conducting prescribed fire, on surface tracts would increase ground disturbance and associated potential impacts to cultural resources. Activities to control noxious and invasive plant species on the Coosa River and Geneva tracts could result in surface and shallow subsurface disturbance, which could introduce organic materials to lower soil layers, contaminating shallow subsurface cultural resource sites containing early historic or prehistoric datable organics. Surface and shallow subsurface effects could also include horizontal and vertical displacement of the upper portion of soils which could compromise depositional context and integrity, and causing artifact damage. Surveys completed prior to treatments would result in the identification of cultural sites. Weed control with non-disturbing methods would have no impacts. There would be no impact to cultural resources on the Fort Morgan Beach Tracts, Fort Morgan Highway Tracts, Fowl River Tract, and Jordan Lake Tract as these areas have been inventoried and do not contain cultural sites.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions, such as conducting prescribed burns, would increase ground disturbance and associated potential impacts to cultural resources similar to that discussed under Impacts from Vegetative Management Actions. Wildlife habitat manipulation would require cultural resource inventories and clearance prior to ground disturbance to identify the presence of any cultural sites and avoid or mitigate any potential damage.

Impacts from Minerals Management Actions

Cultural resource impacts could occur from managing 119,231 acres of non-USFS FMO as open to leasing subject to standard lease terms and conditions and 91,702 acres of non-USFS FMO as CSU. Based on the RFD, oil and gas developments within these areas would impact 105 acres through the development of 20 wells over 20 years. Development on these acres would typically be subject to Class III cultural resource inventories and evaluation on a project-by-project basis prior to allowing disturbance, resulting in the identification and potential excavation of cultural sites. Stipulations and BMPs applied under this alternative would protect and preserve cultural resources on the 94,589 acres managed as NSO and in areas where surface disturbance would be precluded (8,297 acres).

Impacts to cultural resources from coal development would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Although surface tracts would be closed or limited to motorized use under this alternative, the level of activity that could impact cultural resources would not be anticipated to change compared to Alternative 1 since these tracts are not anticipated to be used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) would be managed as ROW avoidance areas, there would be less potential for ground disturbance and impacts to cultural resources associated with ROW development compared to Alternative 1. If a ROW were proposed on the Fort Morgan Highway and Jordan Lake tracts, an appropriate level of cultural resource survey and consultation with the SHPO under NHPA Section 106 regulations would need to be conducted prior to approval. A cultural resource survey would also be required if existing ROWs on the Fort Morgan Highway and Jordan Lake tracts were expanded or modified. Construction projects could result in inadvertent damage if cultural resources that were undetected during surveys were unearthed during ground-disturbing activities. Following discovery of cultural resources, activities would stop in accordance with terms and conditions in the ROW grant which would minimize further damage to cultural resources. Collocating ROWs where possible would reduce the amount of surface disturbance and potential for inadvertent damage.

Visual Resources

Impacts from Vegetative Communities Management Actions

Undertaking actions to improve vegetation communities, such as removing invasive species, on the surface tracts would temporarily diminish visual quality. Visual quality would be improved in the long term as the condition of vegetation communities improve to meet VRM class objectives.

Impacts from Fish and Wildlife Habitat Management Actions

Undertaking actions to improve fish and wildlife habitat on the surface tracts, such as prescribed burning, would temporarily diminish visual quality. Visual quality would be improved in the long term as wildlife-related recreation and habitat conditions were improved to meet VRM class objectives.

Constructing dune walk-over structures and installing sand fencing to enhance and protect existing dune habitat on the Fort Morgan Beach tract would introduce developments in previously undeveloped areas and thereby diminish visual quality if the developments were to dominate the view of the casual observer. Any potential impacts could be mitigated through careful placement in low-lying areas and applying treatments to blend any structures in with the natural setting.

Impacts from Minerals Management Actions

Since approximately 105 acres of vegetation removal and construction activities would result from the development of 20 oil and gas wells (as with Alternative 1), impacts would be the same as Alternative 1. Stipulations applied under this alternative could indirectly protect visual resources on the 94,589 acres managed as NSO and in areas where development would be precluded (8,297 acres). Since no mineral development activities would occur on the surface tracts, there would be no violations of VRM class objectives.

Impacts from Recreation and Travel Management Actions

Continuing to allow recreation use on the surface tracts would result in impacts similar to those described under Alternative 1. Since the tracts would be managed as limited or closed to motorized vehicle use, impacts to visual quality would be reduced as there would be less potential for vegetation and soil removal from these activities. Furthermore, because the surface tracts are not currently used extensively for recreation, anticipated impacts would be minimal.

Impacts from Lands and Realty Management Actions

Managing the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) as ROW avoidance areas would retain the visual quality on these tracts since ROWs would not be approved on the tract unless it met resource objectives. Making the Fort Morgan Highway and Jordan Lake tracts available for ROWs could further diminish visual resource qualities if the ROWs were to dominate the view of the casual observer; however, collocating ROWs could reduce the extent of impacts to visual quality.

Minerals

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Minerals Management Actions

Applying the lease stipulations and BMPs in Appendix D could restrict or preclude oil and gas development and exploration. Impacts would not be anticipated on approximately 119,231 acres open to leasing subject to standard lease terms and conditions. Managing approximately 91,702 acres as open to leasing, subject to minor constraints and 94,589 acres as open to leasing, subject to major constraints would allow for recovery of resources and could increase development costs. Allowing for exceptions, waivers, and modifications to these stipulations could create opportunities for the discovery of new oil and gas resources. Closing 8,297 acres to oil and gas leasing would preclude oil and gas development and exploration in these areas.

Impacts to coal leasing and development would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Lands and Realty Management Actions

Lands and realty management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Recreation and Travel Management

Impacts from Vegetative Communities Management Actions

Undertaking actions to improve vegetation communities, such as removing invasive species, on the surface tracts would temporarily diminish the recreation experience since recreationists could be displaced from vegetation treatment areas until revegetation occurs. The recreation experience would be improved in the long term as the condition of vegetation communities improve by improving the long-term aesthetics of an area.

Impacts from Fish and Wildlife Habitat Management Actions

Undertaking actions to improve wildlife habitat on the surface tracts, such as prescribed burning, would temporarily diminish the recreation experience since recreationists could be displaced from protected areas or treated areas until revegetation occurs. The recreation experience would be improved in the long term as wildlife-related recreation and habitat conditions are improved by improving the long term aesthetics and wildlife viewing of an area.

Constructing dune walk-over structures and installing sand fencing to enhance and protect existing dune habitat on the Fort Morgan Beach tract would enhance the recreation experience. Installing walk-overs and fencing would introduce developments in previously undeveloped areas, it would also introduce intrusions to the natural setting. While this could reduce some recreationists experience, these facilities are generally accepted by the public. Any potential impacts could be mitigated through applying treatments to blend any structures in with the natural setting.

Impacts from Minerals Management Actions

Since approximately 105 acres of vegetation removal and construction activities would result from the development of 20 oil and gas wells on non-USFS FMO (as with Alternative 1), impacts would be the same as Alternative 1. Stipulations applied under this alternative could indirectly protect the recreational opportunities on the 94,589 acres managed as NSO and in areas where development would be precluded (8,297 acres) by precluding ground disturbance and infrastructure associated with oil and gas development.

Impacts from Recreation and Travel Management Actions

Continuing to allow recreation use on the surface tracts would result in impacts similar to those described under Alternative 1. Since motorized vehicle use would be limited or closed on the surface tracts, more non-motorized recreation opportunities would increase while there could be a loss of travel opportunities. Since surface tracts are not currently used extensively for motorized travel, the anticipated impact would be minimal.

Impacts from Lands and Realty Management Actions

Impacts from the transfer of Lots 73 and 74 of the Fort Morgan Beach tracts to the USFWS would be the same as Alternative 1. Managing the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) as ROW avoidance areas would retain the recreation experience on these tracts. Making the Fort Morgan Highway and Jordan Lake tracts available for ROWs could diminish the quality of the recreation experience. These actions could provide additional opportunities for travel due to the construction of access roads.

Lands and Realty

Under Alternative 2, the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) would be managed as avoidance areas for ROW. This could impose design and siting requirements and associated costs on new ROW or amended or renewed ROW at existing sites. There would be an increased potential for requests for new or amended and renewed ROW at existing sites to be denied. Making the Fort Morgan Highway and Jordan Lake tracts available for ROW would accommodate access and efficient energy supply (by allowing pipelines and transmission lines), and minimize additional costs; however, new ROW would be restricted to the existing ROW corridor on the Fort Morgan Highway tract and ROW would be co-located if possible on the Jordan Lake tract. This would affect desired placement of facilities on these tracts.

Retaining the surface tracts under BLM administration and pursuing partnerships with other agencies and organizations could allow for management opportunities for other agencies and organizations, but would not allow for non-Federal ownership opportunities. Partnerships would allow for more efficient and comprehensive resource management of the surface tracts.

Social and Economic

Impacts from Vegetative Communities Management Actions

This alternative includes the removal of invasive species on three BLM land tracts and the planting of dune vegetation on the Fort Morgan Beach tract. Impacts from these actions on the economic indicators would not be anticipated from these types of vegetation management actions. Stakeholders who value access may be impacted by restrictions to the Fort Morgan Beach tracts from planting activities.

Impacts from Fish and Wildlife Habitat Management Actions

Impacts to social and economic conditions from fish and wildlife habitat management actions would be the same as impacts identified from Vegetative Communities management actions.

Impacts from Minerals Management Actions

The same number of wells and acres of surface disturbance as Alternative 1 are anticipated under this alternative. This alternative would apply leasing stipulations to protect sensitive species and their habitats, including buffers for wetland and aquatic resources. Relative to Alternative 1, the exploration and development costs could increase while the availability for locations for well pads could decrease. This alternative would also provide for the greatest amount of protection for wetland resources. Since the number of wells anticipated is small relative to total wells in the area, there would be minimal changes, with possibly slight increases in employment or income (and the same as Alternative 1). Social indicators such as housing, education, and cost of living would not be anticipated to change under this alternative.

Similar disturbances from oil and gas development would occur as compared to Alternative 1, although potential impacts to wetlands, soils, vegetation, habitat, and wildlife would be anticipated to be reduced under this alternative due to the implementation of seasonal, NSO, CSU stipulations. Oil and gas development and production can have implications for visual and scenic qualities as well as property values, as described under Alternative 1. These impacts are likely less than those under Alternative 1, as there are more conditions and constraints on well-pad locations under Alternative 2.Industry costs and availability for well pad locations would likely increase under this alternative, which would result in adverse impacts for the oil and gas industry.

Under this alternative, impacts would be the same as Alternative 1 for coal development.

Impacts from Recreation and Travel Management Actions

Under this alternative, surface tracts would be open to recreational use, but designated as limited for OHVs, and vehicle use is only allowed on public roads and authorized ROW. Social and economic conditions would be similar to Alternative 1 since minimal changes in recreation and travel management are anticipated. However, OHV users would likely be adversely impacted if trails and roads are closed to this type of motorized use.

Impacts from Lands and Realty Management Actions

Although the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts would be managed as ROW avoidance areas, impacts to social and economic conditions would be the same as Alternative 1.

Hazardous Materials

Impacts would be the same as Alternative 1.

4.2.3 Alternative 3 (Preferred Alternative)

Air Quality

Under this alternative, there is a potential for wildfire which could lead to air emissions. Since all fires would be suppressed, these occurrences would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas and coal development and associated air emissions would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Although surface tracts would be closed or limited to motorized use under this alternative, the level of activity contributing to emissions would not change compared to Alternative 1 since these tracts are not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent of BLM surface ownership in Alabama) would be managed as ROW avoidance areas, there would be less potential for emissions associated with the use of trucks and heavy equipment (bulldozers, etc.) for ROW development compared to Alternative 1. Impacts from potential ROW development on the Jordan Lake and Fort Morgan Highway tracts would be the same as Alternative 1.

Soil Resources

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated impacts on 105 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (117,506 acres), and NSO (43,239 acres) restrictions would be implemented, which would reduce disturbance to soils within the protected areas. Under this alternative, the NSO area around aquatic habitats identified in Alternative 2 would be reduced to 250-feet, which would reduce protections to soils within these areas as compared to Alternative 2. In most cases, this buffer is expected to prevent construction activities from increasing erosion to the point that sedimentation of local drainages and wetlands increases. In areas with slopes over 25 percent, additional measures may be needed to stabilize disturbed soils. Impacts to prime or unique farmlands would be the same as described for Alternative 1.

Impacts from Recreation and Travel Management Actions

Although surface tracts would be closed or limited to motorized use under this alternative, the level of activity and associated impacts to soil resources would not be anticipated to change compared to Alternative 1 since these tracts are not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Disposing the surface tracts under the condition that uses would be consistent with the resource management goals and objectives and allowable uses and management actions established under this alternative would limit or restrict activities that impact soils. Although development once the tracts are disposed could result in soil impacts from vegetation-clearing activities and construction ground disturbance, limitations for habitat protection and resource management would be likely to reduce the potential for erosion or loss in soil productivity. The effects from ground disturbance during construction, vegetation treatments, or habitat improvements would be short term. If permanent roads or structures are constructed on the tracts, the effects would be long term but localized.

ROW management actions and associated impacts to soils would be the same as Alternative 2.

Water Resources

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated impacts on 105 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (117,506 acres), and NSO (43,239 acres) restrictions would be implemented, which would reduce disturbance to water resources within the protected areas. Under this alternative, the NSO area around aquatic habitats identified in Alternative 2 would be reduced to 250-feet, which would allow development to occur in close proximity to water resources and the potential for impacts to occur. In most cases, this buffer is expected to prevent construction activities from increasing the sedimentation of local drainages and wetlands. In areas with slopes over 25 percent, additional measures may be needed to stabilize disturbed soils above wetlands or aquatic habitats to the point they aren’t impacted by increased sedimentation.

Impacts from coal mining would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Although surface tracts would be closed or limited to motorized use under this alternative, the level of activity and associated impacts to water resources would not be anticipated to change compared to Alternative 1 since these tracts are not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Disposing the surface tracts under the condition that uses would be consistent with the resource management goals and objectives and allowable uses and management actions established under this alternative would limit or restrict activities that impact water resources. Although development of the tracts could involve vegetation-clearing activities and construction ground disturbance that could increase surface runoff and degrade water quality, limitations for habitat protection and resource management would be likely to reduce the potential for these impacts. The effects from ground disturbance during construction, vegetation treatments, or habitat improvements would be short term. If permanent roads or structures are constructed on the tracts, the effects would be long term but localized.

ROW management actions and associated impacts to water resources would be the same as Alternative 2.

Vegetative Communities

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Under this alternative oil and gas development would be excluded from a 250 foot buffer around wetland and aquatic habitats and could be extended up to 600 feet where slopes exceed 10 percent. This buffer could be reduced to 100 feet where slopes are less than 10 percent, where there are no special status species issues. This buffer is expected to be adequate to protect most riparian zones and wetland habitats. It is estimated that this stipulation would apply to 38,111 acres or about 12 percent of the FMO, versus 90,930 or approximately 29 percent of the FMO in Alabama.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Impacts from ROWs would be the same as Alternative 2. Under this alternative the Fort Morgan, Fowl River, and Coosa River tracts would be available for transfer to other agencies or groups, but future management would be constrained by the management objectives outlined in this plan. All of the Fort Morgan Beach and Highway tracts would be transferred to the Bon Secour NWR, and would be managed as part of that refuge. Geneva County and Jordan Lake tracts would be available for transfer out of Federal ownership. Impacts to vegetation on the Fort Morgan, Fowl River, and Coosa River tracts would be the same as Alternative 2. The sale of the Geneva County tract is not expected to change the current uses and no impacts to vegetation are anticipated.

Fish and Wildlife

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Impacts would be similar to those discussed under special status species. The acreage disturbed would be same and wells would be shifted away from sensitive habitats, although under this alternative the buffer would be reduced to 250-feet, with the option of increasing it to 600-feet where needed because of steep slopes or erosive soils. The buffer could be reduced to 100-feet where slopes are less than 10 percent and there are no special status species issues. These buffers are expected to be sufficient for most wildlife species, using wetland and aquatic habitats, but interior forest nesting birds and some amphibians and reptiles may be impacted by this reduced buffer through habitat disturbance. Karst habitats and most naturally occurring prairies and glades would be protected under this alternative.

Under this alternative, the coastal no lease areas would be replaced with a NSO buffer. This change has some potential to promote offsite drilling. Disturbance of maritime habitats would contribute to the loss of important foraging habitats for migrating song-birds and shore-birds nesting in nearby dunes.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Impacts from ROWs would be the same as Alternative 2. No impacts to wildlife are anticipated from the disposal of the Geneva County tract because no land use changes are expected.

Special Status Species

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

The number of wells (20) and acres disturbed (105) would remain the same under this alternative and impacts would be the same as Alternative 2, except in the following situations.

The aquatic and wetland buffer would be reduced to 250-feet. In areas where slopes exceed 10 percent, the buffer could be extended up to 600-feet to provide adequate protection. In areas with slopes less than 10 percent, the 250-foot buffer could be reduced to a minimum of 100-feet, if the adjacent waterway or wetlands have been surveyed and no special status species occur within 100-yards upstream and 300-yards downstream of the site. This stipulation could be applied to an estimated 38,111 acres or 12 percent of the non-USFS FMO available for leasing in Alabama. In most cases, this buffer is expected to prevent construction activities from increasing the sedimentation of local drainages and wetlands. In areas with slopes over 25 percent, additional measures may be needed to stabilize disturbed soils above wetlands or aquatic habitats.

Under this alternative, the coastal no lease areas would be replaced with a NSO buffer. This change could affect nesting sea turtles, piping plover, and critical habitat for Alabama beach mouse, including adjacent upland scrub habitats. Although no surface disturbance would occur on non-USFS FMO or BLM surface tracts, offsite directional drilling to target these Federal minerals would be permitted under this alternative. Any directional wells targeting non-USFS FMO that may affect Federally-listed species or critical habitat would require coordination with the USFWS.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Impacts from ROW would be the same as Alternative 2. Under this alternative, the Fort Morgan, Fowl River, and Coosa River tracts would be available for transfer to other agencies or groups, but future management would be constrained by the management objectives outlined in this plan. All of the Fort Morgan Beach and Highway tracts would be transferred to the Bon Secour NWR and would be managed as part of that refuge. Alabama beach mouse, piping plover, and snowy plover would benefit from the same activities discussed under Alternative 2.

Under this alternative, the Geneva and Jordan Lake tracts would be transferred out of Federal ownership. This tract is adjacent to Gulf sturgeon critical habitat, but no changes of use are anticipated. At the Jordan Lake tract, there may be opportunities to construct boat docks or other lake access facilities, but the tract may be too narrow to prompt the construction of additional camps. In both cases the overall use pattern is not expected to change and no adverse effects to special status species anticipated.

Wildland Fire Ecology and Management

Impacts from suppressing all wildland fires and allowing prescribed burning on a case-by-case basis would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Impacts to wildland fire ecology and management from anticipated oil and gas development and associated disturbance of 105 acres would be the same as Alternative 1. Impacts would not occur on the closed (8,179 acres) and NSO (43,239 acres) areas created through applying the stipulations in Appendix D.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

ROW management actions and associated impacts would be the same as Alternative 2.

Cultural Resources

Impacts from cultural resources management and wildland fire management actions would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Impacts to cultural resources from management of non-USFS FMO would be the same as Alternative 2, except 144,895 acres would be managed as open to leasing subject to standard lease terms and conditions, 117,506 acres as CSU, 43,239 acres as NSO, and 8,179 acres as closed. The 105 acres of disturbance resulting from the anticipated 20 wells could impact cultural resources within areas managed as open to leasing subject to standard lease terms and conditions or CSU. Impacts to cultural resources are not anticipated in areas managed as NSO or closed since surface disturbance would be precluded.

Impacts to cultural resources from coal development would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Although surface tracts would be closed or limited to motorized use under this alternative, the level of activity and associated impacts to cultural resources would not be anticipated to change compared to Alternative 1 since these tracts are not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Making the surface tracts available for disposal could result in the removal of cultural properties from Federal ownership and the associated protection by laws, regulations, and policies. Before any transfer of management responsibilities or ownership, an appropriate level of cultural resource survey and consultation with the SHPO under NHPA Section 106 regulations would need to be conducted. Disposing the property from Federal ownership would remove protection of any cultural resources under Federal law; however, by applying conditions and restrictive covenants on management and use after disposal, damage to previously undetected cultural resources could be mitigated.

Management actions and impacts associated with ROW development would be the same as Alternative 2.

Visual Resources

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Since approximately 105 acres of vegetation removal and construction activities would result from the development of 20 oil and gas wells (as with Alternative 1), impacts would be similar to Alternative 1. Stipulations applied under this alternative could preclude oil and gas development thereby protecting visual resources on the 43,239 acres managed as NSO and in areas where development would be precluded (8,179 acres). Since no mineral development activities would occur on the surface tracts, there would be no violations of VRM class objectives.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts to visual resources would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Although the Coosa River, Fort Morgan Beach (Lots 13, 14, 24, 54, and 55), Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts would be available for disposal from Federal ownership, specified conditions on management and use after disposal to meet resource objectives would protect visual quality.

ROW management actions and associated impacts would be the same as Alternative 2.

Minerals

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Minerals Management Actions

Applying the lease stipulations and BMPs in Appendix D could restrict or preclude oil and gas development and exploration. Under this alternative, the NSO area around aquatic habitats identified in Alternative 2 would be reduced to 250 feet and the no lease stipulation for Alabama beach mouse habitat would be NSO. Impacts would not be anticipated on approximately 144,895 acres open to leasing subject to standard lease terms and conditions. Managing approximately 117,506 acres as open to leasing, subject to minor constraints and 43,239 acres as open to leasing, subject to major constraints could increase development costs. Allowing for exceptions, waivers, and modifications to these stipulations could create opportunities for the discovery of new oil and gas resources.

Impacts to coal leasing and development would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Lands and Realty Management Actions

Lands and realty management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Recreation and Travel Management

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts to recreation and travel would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions and associated impacts to recreation and travel would be the same as Alternative 2.

Impacts from Minerals Management Actions

Since approximately 105 acres of vegetation removal and construction activities would result from the development of 20 oil and gas wells (as with Alternative 1), impacts would be the same as Alternative 1. Stipulations applied under this alternative could indirectly protect the recreational opportunities on the 43,239 acres managed as NSO and in areas where development would be precluded (8,179 acres) by eliminating associated ground disturbances, noise, and infrastructure.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Impacts from the transfer of Lots 73 and 74 of the Fort Morgan Beach tracts to the USFWS would be the same as Alternative 1. Although the Coosa River, Fort Morgan Beach (Lots 13, 14, 24, 54, and 55), Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts would be available for disposal from Federal ownership, specified conditions on management and use after disposal to meet resource objectives could protect recreational settings, although access could be reduced if not specifically included in the conditions for use or restrictive covenants.

ROW management actions and associated impacts would be the same as Alternative 2.

Lands and Realty

ROW management actions and associated impacts to lands and realty would be the same as Alternative 2. Under Alternative 3, the Coosa River and Fowl River tracts would be available for disposal under the condition that uses would be consistent with the resource management goals and objectives and allowable uses and management actions established under this alternative. This would allow opportunities for other Federal agency or non-Federal ownership, but would restrict future use of the tracts. All of the Fort Morgan Beach (including Lots 73 and 74) and Fort Morgan Highway tracts would be available for transfer to the USFWS as part of the Bon Secour NWR. This would facilitate Federal management of the tracts, but would not allow opportunities for other Federal agency or non-Federal ownership. The Geneva and Jordan Lake tracts would be available for disposal from Federal ownership, which would allow for opportunities for other Federal agency or non-Federal ownership without specified conditions on future use of the tracts.

Social and Economic

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts to social and economic conditions would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Impacts to social and economic conditions from fish and wildlife habitat management actions would be the same as impacts identified from vegetative communities management actions.

Impacts from Minerals Management Actions

The same number of wells and acres of surface disturbance as Alternative 1 is anticipated under this alternative; however, this alternative places leasing stipulations to protect sensitive species and their habitats, including buffers for wetland and aquatic resources. Relative to Alternative 1, the exploration and development costs could increase while the availability for locations of well pads could decrease, which would result in adverse impacts to the oil and gas industry. Since the number of wells anticipated is small relative to total wells in the area, there would be minimal social and economic changes, possibly slight increases in employment or income, as compared with the current situation. Oil and gas development and production can have implications for visual and scenic qualities as well as property values. These impacts are likely less than those under Alternative 1, as there are more conditions and constraints on well-pad locations under Alternative 3. Social indicators such as housing, education, and cost of living would not be anticipated to change under this alternative.

Under Alternative 3, impacts would be the same as Alternative 1 for coal development.

Impacts from Recreation and Travel Management Actions

Under Alternative 3, socioeconomic impacts would be the same as those identified under Alternative 2.

Impacts from Lands and Realty Management Actions

Under Alternative 3, Lots 73 and 74 of the Fort Morgan Beach tracts would be transferred to the USFWS and a number of dispersed BLM surface land tracts would be available for disposal from Federal ownership with specified conditions on management and use after disposal to meet prescribed resource objectives. Although development could be allowed on these properties, it would be limited or restricted to activities that are consistent with prescribed resource management objectives. Since the types of activities on these lands are not likely to considerably change, there would be minimal impact to social and economic conditions under this alternative.

Hazardous Materials

Impacts would be the same as Alternative 1.

4.2.4 Alternative 4

Air Quality

Under this alternative, there is a potential for wildfire which could lead to air emissions. Since all fires would be suppressed, these occurrences would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground disturbing activities of a severity or extent that would deteriorate air quality conditions. Prescribed burning conducted to meet vegetation resource objectives would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground disturbing activities of a severity or extent that would deteriorate air quality conditions. Prescribed burning conducted to meet habitat objectives would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas and coal development and associated air emissions would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Although surface tracts would be closed or limited to motorized use under this alternative, the level of activity contributing to emissions would not change compared to Alternative 1 since these tracts are not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent of BLM surface ownership in Alabama) would be managed as ROW avoidance areas, there would be less potential for emissions associated with the use of trucks and heavy equipment (bulldozers, etc.) for ROW development compared to Alternative 1. Impacts from potential ROW development on the Jordan Lake and Fort Morgan Highway tracts would be the same as Alternative 1.

Soil Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in disturbance or loss of soils.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in disturbance or loss of soils.

Impacts from Minerals Management Actions

Impacts to soil resources from minerals management, including oil and gas and coal development, would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Although surface tracts would be closed or limited to motorized use under this alternative, the level of activity that could impact soil resources would not be anticipated to change compared to Alternative 1 since these tracts are not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Disposing the tracts from Federal ownership with no restrictive covenants could increase chances for subsequent development and associated impacts to soil resources. This could result in impacts to soils from vegetation-clearing activities and construction ground disturbance, which could increase surface runoff and erosion. The effects from ground disturbance during construction, vegetation treatments, or habitat improvements would be short term. If permanent roads or structures are constructed on the tracts, the effects would be long term but localized.

ROW management actions and associated impacts to soil resources would be the same as Alternative 2.

Water Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to water quality.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to water quality.

Impacts from Minerals Management Actions

Impacts to water resources from minerals management, including oil and gas and coal development, would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Although surface tracts would be closed or limited to motorized use under this alternative, the level of activity that could impact water resources would not be anticipated to change compared to Alternative 1 since these tracts are not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Disposing the tracts from Federal ownership with no restrictive covenants could increase chances for subsequent development and associated impacts to water resources, as described under the impacts to soil resources section.

ROW management actions and associated impacts to water resources would be the same as Alternative 2.

Vegetative Communities

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could increase the potential for exotic, invasive species to become established or spread on BLM surface tracts. Chinese privet is likely to continue to spread on the Coosa River tracts, and the Fort Morgan highway tracts are vulnerable to both Cogon grass and Chinese tallow. Cogon grass in particular, once established, would displace native herbaceous plant species and ultimately could reduce some shrub and tree components by increasing the frequency of wild fires and crowding out seedlings.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under impacts from vegetative communities management actions.

Impacts from Minerals Management Actions

Impacts from minerals management, including oil and gas and coal development, would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Following disposal, it is assumed that the Fort Morgan and Fowl River tracts would be developed for residential or recreational use, and that recreational facilities would be constructed on the Coosa River and Jordan Lake tracts. It is expected that there would be some short term and long term loss of vegetation at all of these sites depending on the extent of the development as a result of vegetation removal, conversion to development, and introduction of invasive species. No impacts to vegetation are anticipated at the Geneva County tract as changes of use are not anticipated.

Fish and Wildlife

Impacts from Vegetative Communities Management Actions

No vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could result in habitat degradation on any of the BLM surface tracts. The maritime forests, scrubs, and flatwoods on the Fort Morgan Highway tracts are particularly vulnerable to Cogon grass and Chinese tallow.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under impacts from vegetative communities management actions.

Impacts from Minerals Management Actions

Impacts from minerals management, including oil and gas and coal development, would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Impacts from ROW actions would be similar to Alternative 2. After transfer to private ownership, the Fort Morgan and Fowl River tracts are expected to be developed for residential and recreational use. At Fort Morgan, private development of the beach tracts could result in the loss of up to 28.7 acres of habitat for nesting and wintering shorebirds. Additional development of the Fort Morgan highway tracts could result in the loss of up to 41.28 acres of maritime forest, scrub and wetland habitats. These tracts are part of a narrow band of habitat that provides crucial refuge for migrating songbirds, as well as resident wading birds, song birds and a wide variety of reptiles and amphibians, including alligators and up to eight native frog species.

Development of the Fowl River tract would likely result in the loss of wetland habitats and increased public use that would exclude more secretive wildlife, including many species of wading birds. Recreational development of the Jordon Lake and Coosa River tracts is not expected to alter species diversity or patterns of use at those tracts since the Jordan Lake tract is already developed for recreation and the Coosa River tracts are generally inaccessible islands.

Special Status Species

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could increase the potential for exotic, invasive species to become established or spread on BLM surface tracts. Cogon grass at the Fort Morgan Highway tracts, in particular, has the potential to alter Alabama beach mouse critical habitat as it forms dense stands displacing native herbaceous plants and potentially increasing fire frequency and intensity.

Under this alternative, BLM would not actively promote the restoration of coastal dunes through plantings/sand fence installation projects following damage by major storm events. These dune restoration projects promote sand deposition and facilitate the return of habitat conditions suitable for Alabama beach mouse. Without these projects it is likely to take longer for sand to accumulate and for dune vegetation to become re-established, postponing the reestablishment of Alabama beach mouse populations after catastrophic events.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under impacts from vegetative communities management actions.

Impacts from Minerals Management Actions

Impacts from minerals management, including oil and gas and coal development, would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

The transfer of the BLM surface tracts to private ownership is likely to result in loss of habitat for the Alabama beach mouse, piping plover, snowy plover, and bald eagle, as well as potential habitat for Alabama red-belly turtle. Any development of the Fort Morgan Beach tracts would result in the direct loss of occupied critical habitat for the Alabama beach mouse. Development of the highway tracts are likely to result in the loss of important scrub habitats designated as critical habitat. Because the Fort Morgan Beach and Highway tracts are designated critical habitat, USFWS would have to authorize a taking permit through the Section 7 process of the Endangered Species Act to before such transfers could be approved.

Recreational development of the Coosa River tracts could result in abandonment of the existing bald eagle nest and exclude future nesting, depending on the location of facilities and intensity of public use. No impacts to special status species are expected as a result of anticipated development on the Fowl River, Jordon Lake or Geneva County tracts. At Fowl River, it is unlikely that any future development of the site would substantially alter the wetland characteristics of the site and render it unsuitable for red-belly turtle. The Jordon Lake tract does support any known populations of special status species. No development is expected to occur on the Geneva County tract, which is adjacent to critical habitat for the Gulf sturgeon.

Wildland Fire Ecology and Management

Impacts from suppressing all wildland fires and allowing prescribed burning on a case-by-case basis would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

Although no specific vegetative communities actions are proposed, allowing vegetation manipulation to meet resources objectives under standard management common to all alternatives would serve to decrease vegetation density and cover (fuel load) and maintain natural fuel conditions across the surface tracts. This would maintain natural disturbance regimes which would be easier to manage through prescribed fire or other treatments. This would also decrease the frequency and intensity of wildland fires and allow fires to be more easily controlled, better protecting life, public safety, and property and resource values. However, lack of specific areas and species being managed could result in invasions and fuel accumulations that would increase the frequency and intensity of wildland fires.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative, therefore no impacts would be anticipated. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would result in impacts similar to those discussed under impacts from vegetative communities management actions.

Impacts from Minerals Management Actions

Minerals management actions and associated impacts to wildland fire ecology and management would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Impacts to wildland fire ecology and management from recreation and travel management actions would be the same as Alternative 2 because travel designations would be the same for this alternative.

Impacts from Lands and Realty Management Actions

ROW management actions and associated impacts would be the same as Alternative 2.

Cultural Resources

Impacts from cultural resources management and wildland fire management actions would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would require cultural resource clearances before activity were to occur; therefore, impacts would not be anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would require cultural resource clearances before activity were to occur; therefore, impacts would not be anticipated.

Impacts from Minerals Management Actions

Impacts to cultural resources from minerals management, including oil and gas and coal development, would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Although surface tracts would be closed or limited to motorized use under this alternative, the level of activity and associated potential impacts to cultural resources would not be anticipated to change compared to Alternative 1 since these tracts are not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Making the Coosa River, Fort Morgan Beach (Lots 13, 14, 24, 54 and 55), Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts available for disposal could result in the removal of cultural properties from Federal ownership and the associated protection by laws, regulations, and policies. Before any transfer of management responsibilities or ownership, an appropriate level of cultural resource survey and consultation with the SHPO under NHPA Section 106 regulations would need to be conducted. Disposing the property from Federal ownership would remove protection of any cultural resources under Federal law. Disposing the tracts without any specified management or use would increase the potential for damage or loss of previously undetected cultural resources after the transfer.

Management actions and impacts associated with ROW development would be the same as Alternative 2.

Visual Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to visual quality. Although visual quality would deteriorate in the short term, visual quality would improve in the long term once vegetation has reestablished to meet VRM class objectives.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to visual quality. Although visual quality would deteriorate in the short term, visual quality would improve in the long term once vegetation has reestablished to meet VRM class objectives.

Impacts from Minerals Management Actions

Minerals management, including oil and gas and coal development, and associated impacts to visual resources would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel managements actions and associated impacts to visual resources would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Making the Coosa River, Fort Morgan Beach (Lots 13, 14, 24, 54, and 55), Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts available for disposal from Federal ownership without conditions could result in changes to existing natural or manmade landforms, which would diminish visual quality if the use were to dominate the view of the casual observer. Following disposal, private development actions could create visually intrusive development.

ROW management actions and associated impacts would be the same as Alternative 2.

Minerals

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Minerals Management Actions

Mineral management actions for oil and gas and coal and associated impacts would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Lands and Realty Management Actions

Lands and realty management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Recreation and Travel Management

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to recreation.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to recreation.

Impacts from Minerals Management Actions

Minerals management actions and associated impacts to recreation and travel would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Impacts from the transfer of Lots 73 and 74 of the Fort Morgan Beach tracts to the USFWS would be the same as Alternative 1. Making the Coosa River, Fort Morgan Beach (Lots 13, 14, 24, 54, and 55), Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts available for disposal from Federal ownership without conditions could result in reduced access for recreation and travel opportunities. Following disposal, tracts could be made unavailable for public recreation and inaccessible to travel.

ROW management actions and associated impacts would be the same as Alternative 2.

Lands and Realty

ROW management actions and associated impacts to lands and realty would be the same as Alternative 2. Transferring Lots 73 and 74 of the Fort Morgan Beach tracts to the USFWS as part of the Bon Secour NWR would facilitate Federal management of the lots. Under Alternative 4, the Coosa River, Fort Morgan Beach, Fort Morgan Highway, and Fowl River tracts would be available for disposal from Federal ownership with no restrictive covenants. This would allow for opportunities for other Federal agency or non-Federal ownership without specified conditions on future use of the tracts; however, disposal would not be allowed if it would jeopardize Federally-listed species or designated critical habitat, which could limit some disposals. The Geneva and Jordan Lake tracts would be available for disposal from Federal ownership, which would allow for opportunities for other Federal agency or non-Federal ownership without specified conditions on future use of the tracts.

Social and Economic

Impacts from Vegetative Communities Management Actions

Impacts to social and economic conditions would not be anticipated from vegetative communities management actions since no actions are proposed under this alternative. Standard management actions common to all alternatives, which would allow vegetation manipulation to meet resource objectives, would not be anticipated to be of an extent that would result in impacts to economic or social conditions.

Impacts from Fish and Wildlife Habitat Management Actions

Impacts to social and economic conditions would not be anticipated from fish and wildlife habitat management actions since no actions are anticipated. Standard management actions common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to be of a severity or extent that would result in impacts to economic or social conditions.

Impacts from Minerals Management Actions

Minerals management actions, including oil and gas and coal development, and associated impacts to social and economic conditions would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Under Alternative 4, socioeconomic impacts would be the same as those identified under Alternative 2.

Impacts from Lands and Realty Management Actions

Under Alternative 4, Lots 73 and 74 of the Fort Morgan Beach tracts would be transferred to the USFWS and a number of dispersed BLM surface land tracts would be available for disposal from Federal ownership without conditions on management and use after disposal. This could result in reduced access for recreational activities on these lands and changes to the existing natural landscape. Additionally, private recreational or residential development could impact visual resources, habitat quality, and wildlife populations. Since development could be allowed on these properties, it is possible that the property tax revenues to the local counties would increase more than the Federal Payments in Lieu of Taxes, economically benefiting the counties and the State. It is possible that the private development of these tracts could slightly increase employment and income in these areas. Social indicators, such as housing, education, and cost of living are not expected to be influenced by the minimal development.

Hazardous Materials

Impacts would be the same as Alternative 1.

4.3 DIRECT AND INDIRECT IMPACTS FROM BLM MANAGEMENT ACTIONS IN MISSISSIPPI

This section discusses the potential impacts anticipated from implementation of the management actions under each alternative for the Hancock County tract in Mississippi and for non-USFS FMO on about 517,934 acres in 79 Mississippi counties. Impacts from the allowable uses and management actions proposed for the Hancock County Tract are analyzed if the R&PP patent held by the University of Mississippi were to revert to BLM.

This section is organized by alternative, then by resource. Under each resource, each management action is discussed, including: vegetative communities; fish and wildlife habitat; minerals; recreation and travel management; and lands and realty. A discussion of cumulative impacts for each resource is contained in Section 4.4.2.

4.3.1 Alternative 1 (No Action)

Air Quality

Under this alternative, there is a potential for wildfire which could lead to air emissions. Since all fires would be suppressed, these occurrences would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground disturbing activities of a severity or extent that would deteriorate air quality conditions. Prescribed burning conducted to meet vegetation resource objectives would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground disturbing activities of a severity or extent that would deteriorate air quality conditions. Prescribed burning conducted to meet habitat objectives would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Minerals Management Actions

Combustion processes, construction activities, and vehicle travel associated with potential oil and gas development produce air emissions. Estimated emissions from the development of 10 wells over the next 20 years on BLM-administered non-USFS FMO would produce considerably less emissions than the total planned oil and gas developments in the State (presented in Table 4-4). Those emissions would likely occur over a dispersed geographic area and would not cause any noticeable or measurable effect.

Potential oil and gas leasing on BLM-administered non-USFS FMO is in close proximity to the Sispsy Wilderness in Alabama and the Breton NWR in Louisiana. These emissions could potentially deteriorate wilderness air quality values and ambient air quality attainment. Since emissions would be dispersed over a large geographic area, air quality impacts would not be anticipated.

Table 4-4. Maximum Potential Oil and Gas Air Emissions for BLM and Non-BLM Activities in Mississippi (tons per year)[1, 2]

Well Locations	Emission Type/Pollutant				
	NO_x	SO_2	PM_{10}	CO	VOC
BLM-Administered non-USFS FMO Estate in Mississippi	27.5	0.3	7.8	32.9	27.5
Other Mineral Estate Across Mississippi	33,028	360	9,368	39,513	33,028

1. Using conservative assumptions typical of liquid mineral wells on BLM land.
2. Assumption that all wells are conventional natural gas wells (BLM 2005a).

Impacts from Recreation and Travel Management Actions

Short term, localized increases in dust and emissions could potentially occur from recreation activities and motorized travel. Given the small amount and marsh nature of the Hancock County tract, these activities would not be anticipated to individually deteriorate air quality conditions.

Impacts from Lands and Realty Management Actions

Short term, localized increases in dust and emissions would occur from use of trucks and heavy equipment (bulldozers, etc.) in ROW development. These actions would be conducted in accordance with the Mississippi SIP and local dust control regulations and, given the small amount and marsh nature of the Hancock County tract, would not be anticipated to individually deteriorate air quality conditions or violate air quality standards or regulations.

Soil Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in disturbance or loss of soils.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative; therefore, there would be no impacts to soil resources. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in disturbance or loss of soils.

Impacts from Minerals Management Actions

Mineral exploration, development, and operations on non-USFS FMO would include ground-disturbing and potential contaminant-introducing activities that could impact soils. Oil and gas development operations—specifically, construction of drilling pads, reserve pits, and access roads—would disturb topsoils and alter surface soil characteristics, which could result in both a slight decline in soil productivity and an increase in surface runoff. Increases in erosion and loss of soils due to oil and gas development are a factor of well pad design, slope, erodibility of the soils, proximity of the disturbance, and the intervening vegetation. The potential for erosion increases with prolonged or heavy rains that are typical in this area. Cut and fill slopes are particularly vulnerable before protective plant covers have been established.

Except for 63,004 acres closed to leasing by other surface managing agencies, non-USFS FMO would be open to leasing subject to standard lease terms and conditions (454,930 acres). The estimated 10 wells to be developed on non-USFS FMO in Alabama over the next 20-years would disturb approximately 55 acres. Both Federal and State laws would require the reclamation of mined lands concurrently with mining operations; therefore, the required reclamation and the minimal surface that might be disturbed would result in only localized effects on soils. Operation of the oil and gas wells could also affect the surrounding soils by potential contamination from accidental spills or improper management of hazardous materials or waste. Federal, State, and local regulations would require site characterization and corrective action that would restore soil integrity and productivity.

In few locations there are prime or unique farmlands on non-Forest Service FMO. Though not likely, it is possible that some of the 105 acres of soil disturbance could be on prime or unique farmland. In the event development is proposed in such an area, BLM would implement appropriate mitigation measures to avoid or minimize impacts as described in section 2.3.3.

Impacts from Recreation and Travel Management Actions

Allowing recreation activities, including motorized vehicle use on the Hancock County tract, could result in short term and site-specific increases in erosion; however, given the limited interest in recreation and travel on the tract, any potential effects would be minor and localized.

Impacts from Lands and Realty Management Actions

If new ROW construction were to occur, soils could be impacted by vegetation clearing activities and ground disturbance. Wind and water erosion, and subsequent loss in soil productivity would occur in disturbed areas where revegetation does not occur. These effects would be localized and short term in areas where revegetation is enhanced or permitted. The effect would be long term if roads or structures were constructed on the tracts, but would be localized.

Water Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to water quality.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to water quality.

Impacts from Minerals Management Actions

Except for 63,004 acres closed to leasing by other surface managing agencies, non-USFS FMO would be open to leasing subject to standard lease terms and conditions (454,930 acres). The estimated development of 10 wells on non-USFS FMO in Mississippi over the next 20-years would disturb approximately 55 acres. Increases in sedimentation to streams and wetlands by oil and gas development are a factor of well pad design, slope, erodibility of the soils, proximity of the disturbance, and the vegetation composition. The potential for sedimentation increases with prolonged or heavy rains that are typical in this area. Sediments deposited in intermittent drainages during construction can be transported downstream during periods of high water, increasing turbidity in higher order streams and potentially affecting water quality substantial distances from the construction site. Both Federal and State laws would require the reclamation of mined lands concurrently with mining operations; therefore, the required reclamation and the minimal surface that might be disturbed would result in only localized effects on water resources.

Mineral exploration, development, and operations would include ground-disturbing activities that increase surface run-off, which increases nutrient levels and turbidity and decreases water quality. These activities could also introduce hazardous waste or result in accidental spills that could also deteriorate surface water quality. Leakage of drill fluids, hazardous waste spills, or leakage from reserve pits could be introduced into the ground water as well. Although Federal, State and local regulations would require site characterization and corrective action for hazardous waste and spills, impacts to the water quality could be localized but long term, especially affecting nonflowing waterbodies (e.g., small ponds or wetlands) and ground water resources. Additionally, access roads and well pads could alter the local hydrology reducing surface flow to mesic areas and diverting or degrading surface water. Installation of culverts and diverting existing drainages around well pads help to maintain existing hydrologic systems, but the disturbance causes local sedimentation and could retard sheet flow.

Impacts from Recreation and Travel Management Actions

Managing the surface tracts as open to recreation and motorized vehicle use could result in short term and site-specific increases in erosion and surface run-off, which increases nutrient levels and turbidity and decreases water quality; however, given the limited interest in recreation and travel on the Hancock County tract, any potential effects would be minor and localized.

Impacts from Lands and Realty Management Actions

If new ROW construction were to occur on the Hancock County tract, vegetation-clearing activities and construction ground disturbance could increase soil erosion and surface run-off, which increase nutrient levels and turbidity and decreases water quality. Impacts would be short term in areas where revegetation was enhanced or permitted. The effect would be long term but localized if roads or structures were constructed on the tracts. The hydric soils associated with the wetlands that encompass most of the tract could be affected by development or construction activities that would dredge or fill the wetlands, compacting soils and hindering natural flow through the wetlands and potentially resulting in the loss of these emergent wetlands.

Vegetative Communities

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could result in increased potential for invasive/exotic species becoming established or spreading. This is particularly true of the higher elevations of the Hancock County tract located on Point Clear Island. Cogon grass and Chinese tallow are both known to occur in the area and if uncontrolled could substantially alter these maritime habitats by displacing native species and increasing the susceptibility to wildfire.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under impacts from vegetative communities management actions.

Impacts from Minerals Management Actions

Oil and gas development is expected to disturb 55 acres of vegetation under this alternative. The effect this disturbance would have on vegetation would be dependent on the location and design of well pads, roads and production facilities. In recent years, most wells on non-USFS FMO have been located in the Maxie Field in Forrest County. Typically, the vegetation most likely to be affected in this area is pine plantations or commercial pine forests, often loblolly pine. Understory species vary depending on how the stand has been managed. Once young pine plantations shade out “old field growth” at about 10 to 15 years of age, the midstory and ground cover are generally very limited. After thinning, shrubs and young hardwoods become established. Use of prescribed fire in these stands favors an increase in grasses and native forbs.

During a routine well pad installation, saleable timber would be removed from the site, if the stand is commercially viable, but is otherwise cut and left onsite. Vegetation debris piles are stored along the edges of the construction site and may be buried onsite, burned, or left in place after drilling operations are completed. Vegetation debris is not permitted in the reserve pit, as it can disrupt any future monitoring of the pit contents.

During interim reclamation, the reserve pit area is graded and the surface fertilized, seeded, and mulched. Although the operators are encouraged to use native seed, the final mix and tree planting is approved by the private landowner or surface managing agency. BLM, by policy, excludes invasive species, although non-native grasses, particularly annual rye (during the winter months) and Bahia or Bermuda grass (during the summer months) are often used to provide a quick cover for disturbed soils. These sites typically progress through “old field” stage as opportunistic pioneer plant species become established. Within a few years young sapling pine and hardwoods become established. Faster growing pines generally dominate the site for several decades. Outside of the pine belt, pines would gradually overtaken by longer lived hardwoods. In areas where mature hardwood forests are removed, it may take 100 years or more to reestablish hardwood forests with similar structure and even longer before species diversity returns to near pre-disturbance levels.

Surface disturbing activities have the potential to introduce or promote the spread of invasive, exotic plant species. Impacts are dependent on the species planted during restoration activities and the management of the site during and following restoration. Cogon grass is a particular concern because it is very difficult to control and because of its ability to degrade native plant communities and commercial forests. Cogon grass displaces native species and can crowd out pine seedlings and increase susceptibility to wildfire. Including native species in the mix increases diversity and provides a more natural structure. If these areas are mowed following abandonment, these non-native grasses are expected to persist and dominate the site. If, however, the sites are replanted in pine or left unmowed, the areas would progress through old field type growth which is dominated by opportunistic native and non-native species alike. Ultimately, both Bahia and Bermuda grass are expected to become shaded out as a tree or heavy shrub layer becomes established. Japanese honeysuckle and Chinese privet can both persist in shaded situations.

Throughout the State, some plant communities, embedded in the larger forested landscape, are particularly sensitive to disruption and are difficult to restore after surface disturbing activities. Many of these are restricted to a narrow range of soil types, such as glades and prairies; others are sensitive to changes in hydrography, such as bogs, forested wetlands, and seepage slope communities. Construction activities in or near these plant communities can alter the site sufficiently to preclude the reestablishment of these communities in the foreseeable future. Also, because of the limited acreage of these vegetation communities, loss of even the small acreages from BLM permitted oil and gas activities has a disproportionate effect on the plant diversity in an area.

Impacts from Recreation and Travel Management Actions

The Hancock County tract would be open to recreation. Although the Hancock County tract is accessible only by boat, the site would remain open for vehicle use. In the unlikely event that four-wheelers were transported to Point Clear Island, substantial damage could be done on this sensitive barrier island in a very short time. Repetitive use on these sandy soils would damage herbaceous growth and young shrubs and could introduce or promote the spread of exotic plants, particularly Chinese tallow and Cogon grass. Repetitive use on Point Clear would substantially degrade the maritime forest, a critically imperiled plant community in Mississippi.

Impacts from Lands and Realty Management Actions

The Hancock County tract would remain open to ROW applications. Any ROW development could damage sensitive maritime forests and scrubs through ground disturbance, vegetation removal, and introduction of invasive species.

Fish and Wildlife

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could degrade habitats for migratory birds and other wildlife on Point Clear Island by displacing native vegetation and increasing susceptibility to wildfire.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under impacts from vegetative communities management actions.

Impacts from Minerals Management Actions

Oil and gas development on non-USFS FMO is expected to result in the loss of 55 acres of habitat. The effect on general wildlife resources are dependent on the well pad location, design, and need for additional access roads. Impacts would include the direct loss of habitat from the construction of drilling pads, production facilities, pipelines and roads, and from degradation of nearby aquatic or wetland habitats through sedimentation or changes in hydrology. These impacts could occur in anywhere on non-USFS FMO in the State, but have in the past occurred primarily in Forrest County. Impacts to many wildlife species from oil and gas development are localized and temporary. Most common game species and other mobile wildlife species avoid the well pad areas during construction. Less mobile species are directly impacted, and during the spring and early summer this can include nesting neotropical birds. Habitat generalists, including most game species, tend to return to surrounding habitats after the well is completed and construction activities have ceased. However, construction in high value habitats or in areas with more narrowly adapted wildlife species can alter the overall species diversity. Wells and roads in areas of contiguous forests increase habitat fragmentation, reducing the suitability of the area for interior nesting birds and making nests more susceptible to predation and parasitism. Older growth forests, which provide habitat for interior forest nesting birds and a wider diversity of amphibians and reptiles are often located in riparian/ wetland zones. These areas have been set aside as buffers during logging operations or in steeper, less accessible slopes.

Oil and gas drilling continues for 24 hours a day until the well is completed, during this time most wildlife including waterfowl and many song-birds are expected to avoid the immediate area. However, once drilling is completed reserve pits with water can become a hazard for waterfowl and other birds, which can become soiled by drilling fluids. If the well is put into production, there is documentation of birds and bats may use open vent stacks for roosting or perching. Once in these stacks animals can become trapped or asphyxiated. While much of the work documenting this problem has occurred in western States, the situation in Mississippi is expected to be similar.

Access roads and well pads can alter the local hydrography reducing surface flow to mesic areas and diverting or degrading surface water supporting wetland habitats. Installation of culverts and diverting existing drainages around well pads help to maintain existing hydrologic systems, but the disturbance causes local sedimentation and can retard sheet flow to wetland habitats. Amphibians and many reptiles associated with wetland communities are vulnerable to disturbance, as they are not highly mobile and tend to have narrow habitat requirements.

Impacts from Recreation and Travel Management Actions

Point Clear and the surrounding marshes provide secluded areas for nesting shore-birds, wading-birds and song-birds. Although unlikely, the use of any vehicles, such as four-wheelers, during the spring and summer months is expected to increase nest/chick abandonment and could result in the loss of ground nesting bird nests. During the rest of the year, vehicle use is likely to flush foraging and loafing wading and shore-birds and could reduce their use of this critically imperiled plant community.

Impacts from Lands and Realty Management Actions

The Hancock County tract would remain open to ROW applications. Any ROW development could damage sensitive maritime forests and scrubs through ground disturbance, vegetation removal, and introduction of invasive species, which a variety of wildlife species are dependant on. Depending on the time of year, development activities could cause nesting shore-birds to abandon nests and could change use patterns of foraging shore-birds.

Special Status Species

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could result in increased potential for invasive/exotic species becoming established or spreading. This is particularly true of the higher elevations of the Hancock County tract located on Point Clear Island. Cogon grass and Chinese tallow are both known to occur in the area and if uncontrolled could substantially alter the habitats supporting Mississippi diamondback terrapin and tiny-leaved buckthorn. Dense stands of cogon grass would displace native vegetation and could make the island and adjacent marshes more vulnerable to frequent wildfires.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under impacts from vegetative communities management actions.

Impacts from Minerals Management Actions

Oil and gas development on non-USFS FMO in Mississippi is expected to result in the direct loss of 55 acres. Based on previous oil and gas activity, the Federally-listed species most likely to be affected are gopher tortoise, red-cockaded woodpecker, and black pine snake in the East Gulf Coastal Plain, and bald eagles associated with reservoirs and rivers in the northern portion of the State. Drilling could occur outside of these areas and there is some potential to affect small acreages supporting special status species anywhere in the State, outside of three northwestern counties do not contain non-USFS FMO – Coahoma, DeSoto, and Sunflower. There is potential Statewide to affect Federal and State-listed aquatic species.

Gopher tortoise could be impacted by oil and gas activity in upland areas of the East Gulf Coastal Plain where forest practices on private lands have maintained at least a marginally suitable habitat. Foraging habitat for tortoise could also be affected on non-USFS FMO associated with private in holdings in the Chickasawhay, DeSoto and Homochitto National Forests, which support substantial tortoise populations. During construction of wells pads, access roads, and production facilities, gopher tortoises could be impacted by the loss or damage to burrows, destruction of foraging habitat, or killed during construction or by service vehicles. Construction activities and roads within 600-feet of burrows could isolate individuals and reduce reproductive potential within a population. In many cases, the presence of gopher tortoises indicates that habitat is suitable for a host of species associated with dry longleaf pine forests, many of them special status species, such as the black pine snake (*Pituophis melanoleucus lodingi*), which could also be impacted by oil and gas activities.

Red-cockaded woodpecker could be affected by oil and gas development through the loss of nesting habitat within existing clusters and through the loss of current or potential foraging habitat within 0.5

miles of existing clusters. Non-USFS FMO in areas supporting red-cockaded woodpecker is generally privately owned and often managed for commercial timber production. Harvest rotations on these properties are typically too short to sustain suitable nesting habitat for red-cockaded woodpeckers; however, there is potential to impact suitable foraging habitat, particularly on non-USFS FMO near the Chickasawhay, DeSoto, and Homochitto National Forests or Noxubee NWR, areas that support most of the State's population. This stipulation would be applied to the estimated 11,710 acres of non-USFS FMO within 0.5 miles of known red-cockaded woodpecker clusters.

Throughout the State, breeding and wintering bald eagles could be affected by drilling near large rivers or reservoirs. Bald eagles are particularly sensitive during courting, nesting, and fledging young; in Alabama this typically occurs between December 1 and August 1. Construction activities within 1.5 miles of nest sites could result in nest abandonment depending on factors such as visibility and tolerance of individual pairs.

Throughout the State, oil and gas development has the potential to impact aquatic and wetland habitats. This could result in degradation of water quality through contamination and increased sedimentation, direct loss of habitat, and changes in the local hydrography supporting these systems. Increases in sedimentation to streams and wetlands by oil and gas development are a factor of well pad design, slope, erodibility of the soils, proximity of the disturbance, and the intervening vegetation. The potential for sedimentation increases with prolonged or heavy rains that are typical in this area. Cut and fill slopes are particularly vulnerable before protective plant covers have been established. While intact vegetation along riparian/wetland zones and around wetlands can substantially buffer these areas, the steepness of the intervening slopes, particularly over 25 percent can reduce the effectiveness of buffers. Research has shown that a minimum of a 30-foot buffer of vegetation is needed to control sediments; however, construction activities within 100-feet can reduce stream invertebrates, and 1,000-feet or more may be needed to protect some amphibians, reptiles and forest interior birds (Wenger 1999). Sediments deposited in intermittent drainages during construction can be transported downstream during periods of high water, increasing turbidity and burying aquatic invertebrates in higher order streams and potentially affecting special status species substantial distances from the construction site, including Louisiana quillwort (*Isoetes louisianensis*), listed as Federally endangered.

Filling wetlands, including bogs, seepage slopes, wet flatwoods, and forested swamps, generally alters the site sufficiently to preclude the reestablishment of these communities in the foreseeable future, and could result in direct habitat loss for a wide variety of special status species. Because of the limited acreage of these vegetation communities, loss of even the small acreages associated with BLM permitted oil and gas activities has a high potential of destroying or degrading habitat for special status species. Many of these species have limited ranges, so the list of species potentially affected varies by location. For example, the Mississippi Comprehensive Wildlife Conservation Strategy (CWCS) notes 14 special status species are associated with pines seeps and pitcher plant bogs, including eight special status crayfish, five of which are endemic. Henslow's sparrow wintering habitat and breeding habitat for Bachman's sparrow could be lost by construction in or near grassy bogs or wet flatwoods. Construction activities, and particularly linear disturbances related to new roads and pipelines, can disrupt the local hydrography supporting seepage slopes or sheet flow to bogs and swamps degrading these habitats.

There are estimated to be 65 caves in Mississippi located in the northeast corner and east central portions of the State. Caves by their nature are isolated and support highly endemic faunas often with extremely narrow habitat requirements. In Mississippi, this includes two State-listed salamanders and a number of bat species. Although the potential to affect these areas is low, caves are particularly sensitive to oil and gas development. Even minor alterations in temperature, humidity, and water quality or water quantity can result in irreversible impacts. Drilling through cave/karst resources can result in contaminants, such as drilling fluids and cements, draining into the cave/karst system. Karst habitats can be degraded by hydrocarbons from spills or leaks from well casings, storage tanks, reserve pits, pipelines, and production facilities that may enter into the cave/karst systems. Additionally, cementing operations could affect portions of underground drainage systems by restricting groundwater flow and introducing pollutants into karst systems.

Drilling in coastal areas would affect the 18 special status species that are associated with coastal marshes and maritime scrub and woodlands, including brown pelican, Wilson's plover, Mississippi diamondback terrapin and saltmarsh topminnow. At least one special status plant species, tiny-leaved buckthorn (*Sageretia minutiflora*), occurs on coastal shell mounds in this area, but the potential for oil and gas wells being located on non-USFS FMO in these areas is low.

Impacts from Recreation and Travel Management Actions

Because this tract is not accessible by road, few impacts are anticipated by designating the tract open to recreation and vehicles; however, use of four-wheelers on remote upland areas, such as Point Clear Island, could damage sensitive maritime forests and scrubs. Depending on the time of year, any vehicle use could cause nesting shore-birds to abandon nests and could change use patterns of foraging shore-birds, like piping plover, snowy plover, and American oystercatcher.

Impacts from Lands and Realty Management Actions

The Hancock County tract would remain open to ROW applications. Any ROW development could damage sensitive maritime forests and scrubs through ground disturbance, vegetation removal, and introduction of invasive species. Depending on the time of year, development activities could cause nesting shore-birds to abandon nests and could change use patterns of foraging shore-birds, like piping plover, snowy plover, and American oystercatcher or damage their habitats.

Wildland Fire Ecology and Management

Suppressing all wildland fires, unless an in-place site-specific plan determines otherwise, would minimize immediate threats and damage to life, public safety, and developments in the WUI and to natural resource values. Allowing prescribed burning on a case-by-case basis would allow for a reduction in hazardous fuel conditions, improving ability to suppress wildfires while maintaining disturbance levels to which vegetation communities have adapted. Fire response and fuel treatments would apply to the 174 acres of BLM-administered surface land.

Impacts from Vegetative Communities Management Actions

Although no specific vegetative communities actions are proposed, allowing vegetation manipulation to meet resources objectives under standard management common to all alternatives would generally serve to decrease vegetation density and cover (fuel load) and maintain natural fuel conditions across the Hancock County tract. This would maintain natural disturbance regimes which would be easier to manage through prescribed fire or other treatments. This would also decrease the frequency and intensity of wildland fires and allow fires to be more easily controlled, better protecting life, public safety, and property and resource values. However, lack of specific areas and species being managed could result in invasions and fuel accumulations that would increase the frequency and intensity of wildland fires.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would result in impacts similar to those discussed under impacts from vegetative communities management actions.

Impacts from Minerals Management Actions

Minerals development activities would introduce additional ignition sources throughout the non-USFS FMO, increasing the potential of wildland fire occurrence. Disturbance of 55 acres associated with development of 10 wells on non-USFS FMO could provide increased accessibility for fire suppression equipment, and provide fuel breaks in the case of wildland fire events. In addition, the infrastructure associated with the 10 new wells would require protection in wildland fire events. Impacts from mineral development activities would not occur on the 63,004 acres closed to oil and gas development.

Impacts from Recreation and Travel Management Actions

Continuing to manage the Hancock County tract as open to recreation use would allow for dispersed recreation use, which could introduce additional ignition sources and increase the probability of wildland fire occurrence. This would be more prevalent in areas of the tract that are more easily accessible.

Impacts from Lands and Realty Management Actions

Managing the Hancock County surface tract as open for ROW applications could result in the development of ROWs. Development of above-ground ROWs on the Hancock County tract would require additional efforts by firefighters to protect these areas in wildland fire events. Development of ROWs would also result in clearing vegetation to make way for linear features. ROWs could provide fuel breaks, which could help prevent the spread of wildland fires. ROWs could also provide firefighters with increased accessibility for fire suppression equipment. While more ROWs could increase suppression costs, the aspects of ROW development related to vegetation clearing and the potential for increased accessibility could reduce suppression costs.

Cultural Resources

Management of cultural resources provides protection from the potentially damaging effects of surface disturbing activities through implementation of existing laws and policy, such as Section 106 of the NHPA and FLPMA. Federal undertakings typically require cultural resource inventories that would result in the identification of cultural resource sites and determination of eligibility to the NRHP. The cultural resources data acquired through inventories and evaluations would increase knowledge of cultural resources on BLM-administered lands and minerals in the State. Following site-specific inventories, mitigation measures would be prescribed as necessary for eligible properties. Any cultural sites discovered may be considered for further evaluation to assess its eligibility for listing on the NRHP. Through this process, significant impacts on cultural sites eligible for the NRHP would be avoided or mitigated. Avoidance is BLM’s preferred measure to eliminate potential adverse effects. Avoidance preserves the cultural resource in place. If this is not possible under reasonable circumstances, scientifically valid excavation and data recovery is an alternative mitigation method. Scientifically valid excavation would be used as a final measure, and the extent of excavation would be determined through BLM consultation with the SHPO and Tribes.

Data recovery preserves as much of the cultural record as possible through archaeological methods. Any mitigation effort requiring archaeological data recovery is subject to the terms outlined in a Data Recovery Plan and documented through a signed MOU with the SHPO, tribes, and other consulting parties. While data recovery preserves as much data as possible, the excavated portions of the property would be lost or damaged. Removing cultural resources from a site using current scientific methods also reduces future scientific value if more accurate methods of analysis are developed. Mitigation through data recovery also reduces or eliminates other uses of cultural resources sites, such as traditional, public, conservation, or experimental use. The standard inventory and avoidance procedures conducted in conjunction with surface-disturbing actions would protect most cultural resources from significant impacts.

Despite the best efforts to identify all cultural resources, there remains a potential for inadvertent impacts to previously undiscovered sites, especially buried sites with no surface indications. There is a set process through Section 106 for identifying, evaluating, and treating the effects of inadvertent discoveries, reducing potential impacts from these discoveries.

Wildfire, wildfire suppression efforts, and prescribed fire could impact cultural resource sites within the Hancock County tract, including the eligibility characteristics of sites that are listed or eligible for listing on the NRHP. Impacts from wildland fire vary, depending on the temperature and duration of exposure to heat. Generally, higher temperatures and/or longer duration of exposure to heat increases the potential for damage to cultural resources. The nature of wetland vegetation in this tract would result in low intensity wildland fires. Prehistoric and historic resources potentially affected by wildfire may be inorganic (e.g., lithic/rock, ceramics, cans, glass) or organic (e.g., textiles, leathern works, wooden structures). Generally speaking, organic materials are more at risk as they tend to burn or alter at lower temperatures than inorganic items. Wildfire impacts on inorganic cultural resources include fracturing, shattering, and changes in color and internal luster, which might reduce an artifact’s ability to render information about the past. As a general rule, fire would not affect buried cultural materials. Studies show that even a few centimeters of soil cover (four inches) is sufficient to protect cultural materials (Oster n.d.). Wildfires that burn hot and fast through a site may have less of an effect on certain types of cultural materials than fires that smolder in the duff or burn for a long time period, allowing heat from the fire to penetrate the surface. In addition, heat from wildland fires could change the physical nature of the ground, making it harder to identify cultural resources.

Often, cultural resources are more at risk of impact due to fire suppression activities than from wildland fire. Potential impacts from the use of retardants would include rapid cooling and subsequent damage (e.g., breakage, spalling, corrosion, staining, rusting) to archaeological materials. Discoloration or warping of metallic surfaces could also occur. Consultation with a cultural resource specialist during suppression activities in areas containing sensitive cultural resources would help to minimize impacts. Prescribed fire typically burns at a lower temperature and duration than wildfire events, so potential impacts would be less severe than unmanaged wildland fire. Prescribed fire events are managed to obtain a smaller, more manageable, and less intense planned burn. The potential impacts from prescribed fires would typically have less long term impacts than those from an unmanaged wildland fire event.

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would require cultural resource clearances before any activities were to occur; therefore, impacts would not be anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would require cultural resources clearances before any activities were to occur; therefore, impacts would not be anticipated.

Impacts from Minerals Management Actions

Cultural resources on 454,930 acres of non-USFS FMO in Mississippi as open to leasing subject to standard lease terms and conditions could be impacted by oil and gas development. Based on the RFD, oil and gas developments within these areas would impact 55 acres through the development of 10 wells over 20 years. Development on these acres would typically be subject to Class III cultural resource inventories and evaluation on a project-by-project basis prior to allowing disturbance, resulting in the identification and potential excavation of cultural sites. Cultural sites on 63,004 acres closed to leasing would be protected from oil and gas development.

Impacts from Recreation and Travel Management Actions

Recreation activities on the Hancock County tract, including motorized vehicle use, could result in inadvertent damage and vandalism to previously undetected cultural sites. Although the tract would not be used extensively for recreation, the tract is located in wetlands with a high potential for cultural resources to occur, which could increase the potential for inadvertent damage and vandalism.

Impacts from Lands and Realty Management Actions

Ground-disturbing activities associated with ROW construction and maintenance could inadvertently damage cultural resources. Because the Hancock County tract has not been previously surveyed, approved activities would be subject to a ground survey and consultation requirements with SHPO under NHPA Section 106 regulations before construction. Therefore, impacts to cultural resources would be anticipated to be minimal.

Visual Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to visual quality. Although visual quality would deteriorate in the short term, visual quality would improve in the long term once vegetation has reestablished to meet VRM class objectives.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to visual quality. Although visual quality would deteriorate in the short term, visual quality would improve in the long term once vegetation has reestablished to meet VRM class objectives.

Impacts from Minerals Management Actions

Mineral exploration and development on non-USFS FMO tracts (517,934 acres) would result in impacts to visual resources on 55 acres from 10 wells. Removal of vegetation and construction of wells and well pads and introduction of other equipment would decrease visual quality. BLM doesn’t manage the surface for non-USFS FMO tracts; however, BLM can place COAs or best practices to minimize impacts to visual resources as needed. Impacts from these activities would not be anticipated on 63,004 non-USFS FMO acres closed to leasing. Since no mineral development activities would occur on the surface tracts, there would be no violations of VRM class objectives.

Impacts from Recreation and Travel Management Actions

Allowing recreation activities, including motorized vehicle use, on the Hancock County tract could result in decreased visual quality over time from changes to existing natural or manmade landforms and scenic vistas through vegetation and soil loss, particularly on tracts that are in undeveloped areas. Since the surface tracts would not be used extensively for recreation, these impacts are anticipated to be minimal.

Impacts from Lands and Realty Management Actions

If a new ROW were authorized on the currently undeveloped Hancock County tract, visual quality would be diminished if the ROW were to dominate the view of the casual observer.

Minerals

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Minerals Management Actions

Under this alternative, 454,930 acres of non-USFS FMO would be open to leasing, subject to standard lease terms and conditions; 63,004 acres of non-USFS FMO would be closed to leasing. No impacts to oil and gas minerals exploration and development would be anticipated from management of non-USFS FMO tracts.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Lands and Realty Management Actions

Lands and realty management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated. BLM would only dispose of non-USFS FMO with no suspected value and, therefore, there would be no loss of opportunity.

Recreation and Travel Management

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to recreation. Recreationists could be displaced from vegetation treatment areas until revegetation occurs; however, the vegetation treatments would benefit recreationists by improving the long-term aesthetics of an area.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to recreation. Recreationists could be displaced from protected areas or treated areas until revegetation occurs; however, the habitat improvements and protections would benefit recreationists by improving the long term aesthetics and wildlife viewing of an area.

Impacts from Minerals Management Actions

Oil and gas development on non-USFS FMO tracts with surface management by other Federal agencies that are open to the public for recreation, as identified in Table 3-17, could be impacted by the leasing of Federal minerals by BLM or in areas where the public were excluded. Those areas and installations not open to recreation or leasing, which include NPS and USFWS lands, would not be affected. Since approximately 55 acres of vegetation removal and construction activities would result from the development of 10 oil and gas wells on non-USFS FMO there could be a decrease in nature-based recreational opportunities due to conflicts with the developments. Mineral leasing in recreational areas could result in the removal of vegetation; construction of access roads, well pads, and other infrastructure; drilling equipment; and associated noise and dust emissions. Impacts from these activities would include decreased quality of the recreational experience of the non-USFS FMO tracts; however, stipulations applied under this alternative by other surface managing agencies could indirectly protect the recreational resources in areas where development would be precluded (63,004 acres). Oil and gas development could provide additional opportunities for travel due to the construction of access roads.

Impacts from Recreation and Travel Management Actions

Allowing recreation activities including motorized vehicle use on the Hancock County tract would maintain existing recreation and travel opportunities; however, allowing motorized travel could result in conflicts between motorized recreationists and recreationists seeking a more natural setting or experience. Since the tract is not currently used extensively for recreation or travel, these impacts are anticipated to be minimal.

Impacts from Lands and Realty Management Actions

If a new road or utility ROW were authorized on currently undeveloped Hancock County tract, the largely natural recreational experiences available would be diminished as a result of construction activity, ground disturbance, and introduction of new infrastructure; however, these actions could provide additional opportunities for travel due to the construction of access roads.

Lands and Realty

Lands and realty is a resource use rather than an environmental component and impacts on lands and realty are a direct result of their management. Therefore, the following discussion is limited to impacts from lands and realty management actions for the 174 acres of BLM-administered surface ownership in Hancock County, Mississippi. Impacts from disposal of FMO is discussed under impacts to Minerals from Lands and Realty actions.

Under Alternative 1, the 174-acre Hancock County tract would remain open to ROW applications; therefore, no impacts would be anticipated to lands and realty actions. Retaining the Hancock County tract under BLM administration would not allow for opportunities for other Federal agency or non-Federal ownership.

Social and Economic

Definitions and descriptions of potential Environmental Justice populations, including low income and ethnicity statistics, were provided in Section 3.4.13. Since the locations of specific BLM oil and gas activities could not be specifically identified, the Environmental Justice analysis identified low-income populations and high minority populations in counties across the State. Environmental Justice population locations should be further considered at the implementation level to minimize the potential for disproportionate impacts to Environmental Justice populations and to identify any possible mitigation measures that may be required to reduce impacts (for example, dust, noise, traffic, ground water quality) to these populations.

Impacts from Vegetative Communities Management Actions

Impacts to social and economic conditions would not be anticipated from vegetative communities management actions under this alternative. The proposed standard management actions common to all alternatives, allowing vegetation manipulation to meet resources objectives, would not be anticipated to be of an extent that would result in impacts to economic or social conditions.

Impacts from Fish and Wildlife Habitat Management Actions

Impacts to social and economic conditions would not be anticipated from fish and wildlife habitat management actions since no actions are anticipated. The proposed standard management actions common to all alternatives would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, which would not be anticipated to be of an extent that would result in impacts to economic or social conditions.

Impacts from Minerals Management Actions

Since only 10 fluid mineral wells (with standard lease terms and conditions) would likely be drilled over the next 20-years, there would be minimal economic impacts from these activities. This type of BLM mineral development is consistent with the development that occurred in the past, including seven applications for permits to drill between 1983 and 2004. Therefore, there would be minimal, yet slight increases in employment or income. For example, over the past 20 years, there have been 7,632 wells drilled and completed (382 wells drilled per year), with a five year annual employment average of 3,089 employees in the support sector for mining and oil and gas. If we assume that most of this support goes to the drilling and development of the oil and gas wells, there are approximately 8 employees (3089/382) supported annually per well drilled on the BLM-administered minerals. Therefore, over the next 20 years, an additional 10 BLM-administered wells will contribute to the employment of 80 people in these support industries. Social impacts, such as housing, education, and cost of living, would not be anticipated to change as a result of this activity.

Oil and gas development and production can have implications for visual and scenic qualities as well as property values. Although the BLM does not own much of the surface land in Alabama on which wells will be drilled, the permitting of these split estate lands could impact a number of socioeconomic factors. The recreation literature indicates that visitors are likely to pay to view less development or development infrastructure in their recreation experience (Brookshire et al, 1979; Boyle and Bishop, 1984). Since the FMO-administered wells are mostly located on private or State lands, there could be visual impacts but they would likely be borne by residents, not visitors. Additionally, decreases in property values have been associated with the drilling phase (more dramatic) as well as the existence of operating wells (BBC Research and Consulting, 2001; 2006). Because these socioeconomic impacts are associated with mineral development, these impacts are likely greatest under Alternative 1, where standard lease conditions apply as compared to Alternatives 1, 2 and 3, where there are more conditions and constraints on well-pad locations.

Impacts from Recreation and Travel Management Actions

The BLM surface tract is open to dispersed recreational use, including hunting, fishing, hiking, and nature study, and no construction of recreational facilities is expected. Recreation and travel management actions provide for quality of life benefits (i.e., recreation, solitude, open space, scenic values) to local residents and visitors, which are often difficult to quantify. These types of limited recreation and travel management actions do not provide significant economic benefits in terms of employment and income and will not affect social assets, such as housing, education, and crime rates, in the area. Under Alternative 1, these types of socioeconomic impacts are assumed to continue.

Impacts from Lands and Realty Management Actions

Under Alternative 1, the Hancock County tract would remain in Federal ownership. Lands and realty management actions would not cause changes in the economic characteristics (employment, income, and industries) as there are very little changes anticipated under this alternative. Quality of social assets (demographics, housing, cost of living, education) in Hancock County are not likely to be affected by retaining these lands in Federal ownership.

Hazardous Materials

BLM-authorized activities on surface tracts and non-USFS FMO could include the use of hazardous materials, substances, and waste (including storage, transportation, and spills). Such activities include oil and gas development, coal development, and application of pesticides to improve vegetative communities and wildlife habitat. These activities are conducted in compliance with 29 CFR 1910, 49 CFR 100-185, 40 CFR 100-400, CERCLA, RCRA, SARA, TSCA, and CWA and other Federal and State regulations and policies regarding hazardous materials management. Therefore, if a release were to occur, it would be immediately addressed and remediated in accordance with regulation.

4.3.2 Alternative 2

Air Quality

Under this alternative, there is a potential for wildfire which could lead to air emissions; however, since all fires would be suppressed, these occurrences would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Vegetative Communities Management Actions

Undertaking actions to remove invasive plant species on the Hancock County tract and associated use of trucks and heavy equipment would cause short term, localized increases in dust and emissions. Given the small amount and remote nature of surface ownership, these activities would not be anticipated to individually deteriorate air quality conditions.

Impacts from Fish and Wildlife Habitat Management Actions

Conducting prescribed burns to improve habitat on the Hancock County tract would cause short term, localized increases in dust and emissions. Given the small amount and remote nature of the tract, these activities would not be anticipated to individually deteriorate air quality conditions.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated air emissions would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Although the tract would be limited to motorized boating, impacts would be the same as Alternative 1 since this tract is not anticipated to be used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for emissions associated with the use of trucks and heavy equipment (bulldozers, etc.) for ROW development compared to Alternative 1.

Soil Resources

Impacts from Vegetative Communities Management Actions

Undertaking actions to remove invasive plant species on the Hancock County tract could increase site-specific erosion in the short term. Over the long term, improving vegetation communities would reduce erosion and overland flows.

Impacts from Fish and Wildlife Habitat Management Actions

Impacts from fish and wildlife habitat management actions would be similar to Alternative 1. In addition, conducting prescribed burns to improve habitat on the Hancock County tract could increase site-specific erosion in the short term. Over the long term, improving marsh health would reduce erosion.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated impacts on 55 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (123 acres), and NSO (184,192 acres) restrictions would be implemented, which would reduce disturbance to soils within the protected areas. In addition to the stipulations in Appendix D, areas within 1,000-feet of aquatic habitats would be managed with an NSO stipulation, which would eliminate impacts to soils in these areas. Impacts to prime or unique farmlands would be the same as described for Alternative 1.

Impacts from Recreation and Travel Management Actions

Motorized travel would be closed or limited to designated routes on all tracts under this alternative. However, the level of activity that could increase erosion and associated impacts to soils would not be anticipated to change compared to Alternative 1 since these tracts are not anticipated to be used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to soils associated with ROW development compared to Alternative 1.

Water Resources

Impacts from Vegetative Communities Management Actions

Undertaking actions to remove invasive plant species on the Hancock County tract could increase site-specific erosion, which could increase nutrient levels and turbidity and decrease water quality in the short term. Over the long term, these actions would maintain the emergent wetlands, water quality, and groundwater recharge.

Impacts from Fish and Wildlife Habitat Management Actions

Conducting prescribed burns to improve habitat on the Hancock County tract would increase erosion and run-off, which increases nutrient levels and turbidity and decreases water quality in the short term. Over the long term, improving and protecting fish and wildlife habitats would reduce erosion and overland flows.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated impacts on 55 acres would be the same as Alternative 1. A 1,000-foot NSO buffer around aquatic habitats and applying the stipulations in Appendix D would increase the area where seasonal, CSU (123 acres), and NSO (184,192 acres) restrictions would be implemented. This would reduce disturbance to water resources within the protected areas. This stipulation could be applied to an estimated 168,383 acres or 33 percent of the non-USFS FMO available for leasing in Mississippi. This buffer is expected to prevent construction activities from increasing the sedimentation of local drainages and wetlands.

Impacts from Recreation and Travel Management Actions

Motorized travel would be closed or limited to designated routes on all tracts under this alternative. However, the level of activity that could affect water resources would not be anticipated to change compared to Alternative 1 since these tracts are not anticipated to be used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to water resources associated with ROW development compared to Alternative 1.

Vegetative Communities

Impacts from Vegetative Communities Management Actions

The Hancock County tract would benefit from removal of woody exotic, invasive species such as Chinese tallow and Chinese privet which would be removed by hand, and stump treated with approved herbicides. Selective hand spraying of Cogon grass may be required where it is established. Any removal and treatment of exotic invasive plants on this tract would be coordinated with the Hancock County Marshes staff and/or The Nature Conservancy to improve removal of invasive species and minimize impacts to the marshes.

Impacts from Fish and Wildlife Habitat Management Actions

Natural fire is infrequent in these coastal marshes, and the use of prescribed fires is expected to be infrequent and closely coordinated as part of an overall fire plan for the Hancock County Marshes Preserve.

Impacts from Minerals Management Actions

Impacts to vegetation would be similar to Alternative 1; however, under this alternative oil and gas activities would be excluded from a 1,000-foot buffer around wetlands and aquatic habitats, karst areas, shoreline habitats, and habitats like naturally occurring prairies and glades with special status species. This alternative provides additional protection for riparian/wetland areas and reduces the potential for contaminants to leach into wetland communities. Impact to exotic invasive plant species would be the same as in Alternative 1.

Impacts from Recreation and Travel Management Actions

Limiting the Hancock County Marshes tract to motorized boating would prevent damage to vegetative communities by reducing travel and access to recreation opportunities.

Impacts from Lands and Realty Management Actions

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to vegetative communities associated with ROW development compared to Alternative 1.

Fish and Wildlife

Impacts from Vegetative Communities Management Actions

Wildlife would benefit from control of invasive exotic plant species, which could substantially alter upland areas on Point Clear Island. Invasive species control would foster native vegetation and habitats that support wildlife species.

Impacts from Fish and Wildlife Habitat Management Actions

There may be some benefits to wildlife by burning heavy mats of flotsam left by Hurricane Katrina, where it is hampering restoration of marsh and upland habitats. This would foster native vegetation and habitats that support wildlife species.

Impacts from Minerals Management Actions

General impacts to wildlife are expected to be similar to Alternative 1; however, under this alternative, oil and gas activities would be excluded from higher value wildlife habitats, including a 1,000-foot buffer around wetlands and aquatic habitats, shoreline habitats, and habitats like naturally occurring prairies and glades with special status species.

BMPs would be applied under this alternative to reduce impacts to bats, song-birds and waterfowl. All pits containing water ten days after a well is completed would be netted to exclude migratory birds. Other approved methods could also be used to exclude birds. Open vent equipment, such as heater-treaters, separators, and dehydration units will be covered with anti-perching cones to exclude cavity nesting birds and bats. Any powerlines would be built using approved raptor safe designs to prevent electrocution hazards.

Impacts from Recreation and Travel Management Actions

Designating the Hancock County tract as limited to motorized boating would benefit wildlife using these remote marshes and the uplands on Point Clear Island by limiting disturbance to species and their habitats. Any vehicle use on the narrow sand islands would flush foraging and loafing shore-birds, and could cause abandonment of nests.

Impacts from Lands and Realty Management Actions

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to fish and wildlife associated with ROW development compared to Alternative 1.

Special Status Species

Impacts from Vegetative Communities Management Actions

Removing exotic invasive plant species, particularly cogon grass, could improve habitat conditions for the tiny-leaved buckthorn and Mississippi diamondback terrapin. Early detection and control of invasive plant species would reduce the amount of native vegetation displaced and minimize changes to structure that occurs when large amounts of invasive woody material is removed.

Impacts from Fish and Wildlife Habitat Management Actions

Prescribed burns could be used to remove wood debris and flotsam left from Hurricane Katrina that create hazards for wildlife and degrade marshes. Since natural fire is infrequent in these coastal marshes, the use of prescribed fires is expected to be infrequent to mimic natural conditions and closely coordinated as part of an overall fire plan for the Hancock County Marshes Preserve.

Impacts from Minerals Management Actions

Although the number of wells (10) and acres disturbed (55) would remain the same under this alternative as compared to Alternative 1, lease stipulations would shift surface-disturbing activities away from sensitive habitats with potential to support special status species. This is accomplished with NSO buffers or seasonal restrictions. These stipulations could be applied to 211,605 acres or about 41 percent of the non-USFS FMO in Mississippi.

To protect special status species occurring in aquatic or wetland habitats, all oil and gas development activities would be excluded from a 1,000-foot buffer around these habitats. In areas where slopes exceed 10 percent, the buffer could be extended up to 600-feet to provide adequate protection. In areas with slopes less than 10 percent, the 250-foot buffer could be reduced to a minimum of 100-feet, if the adjacent waterway or wetlands have been surveyed and no special status species occur within 100-yards upstream and 300-yards downstream of the site. This stipulation could be applied to an estimated 168,383 acres or about 33 percent of the non-USFS FMO available for leasing in Mississippi. In most cases, this buffer is expected to prevent construction activities from increasing the sedimentation of local drainages and wetlands. In areas with slopes over 25 percent, additional measures may be needed to stabilize disturbed soils above wetlands or aquatic habitats.

A 250-foot buffer around known caves, fractures, and sinkholes would reduce the chances of drilling through karst formations, providing protection for cave endemics, such as cave salamander and spring salamander. Some potential remains for inadvertently drilling through unknown karst formations and damaging connected cave habitats through introduction of lost drilling fluids and muds, altering temperature and moisture regimes, and modifying the hydrology supporting the karst systems. This habitat is extremely limited in Mississippi; less than 100 acres according the Mississippi CWCS, so potential for impacting these areas in Mississippi is low.

Under this alternative, NSO stipulations would be applied to coastal shorelines. This buffer would be applied to 4,237 acres of non-USFS FMO in Mississippi located within 100 feet of mean high tide. Wintering piping plover, snowy plover, brown pelican, least tern, and Mississippi diamondback terrapin are among the many coastal species that would benefit from this buffer. Offsite directional drilling to target these Federal minerals would be permitted under this alternative. Any directional wells that may affect Federally-listed species or critical habitat would require coordination with the USFWS.

Areas with suitable soils and at least 10 percent open pine forest in southern Mississippi counties would require a survey for gopher tortoises prior to any surface-disturbing activities. No disturbance would be permitted within 600-feet of a gopher tortoise burrow. This buffer is expected to protect any breeding populations of gopher tortoise and maintain habitat for associated species including black pine snake. It would also protect habitat values in areas suitable for eastern indigo snake and mimic glass snake.

Under this alternative, NSO would be permitted within 0.5 miles of a red-cockaded woodpecker cluster. This stipulation could be applied to 11,710 acres of non-USFS FMO within 0.5 miles of known clusters and could be applied to additional areas as needed to protect new clusters or potential habitat identified during site assessments prior to leasing. This buffer is expected to contain all foraging habitat required to maintain the red-cockaded woodpecker cluster. There are options for oil and gas activity to occur within suitable foraging habitat if the foraging requirements for the cluster are met elsewhere, for example, clusters maintained on National Forests. This exception would require a concurrence from the USFWS and the State of Mississippi. A concurrence would cause disturbance within the suitable foraging habitat, but if granted would not be anticipated to affect local populations.

Under this alternative, NSO would be permitted with 1,500-feet of a bald eagle nest and/or communal roost site, and no surface-disturbing activities would be permitted within 1.5 miles during the nesting season from December 1 through August 1. This buffer complies with the current Federal guidelines for bald eagle protection. Based on the known nest sites in Mississippi, this stipulation could be applied to 1,089 acres of non-USFS FMO. Oil and gas activity complying with these parameters is not expected to adversely affect bald eagles. New protocols have been drafted that reflect the ongoing recovery of this species. When finalized, the new guidelines would reduce the buffer to 660-feet for construction activities, although existing activities could be conducted within 330-feet of the nest outside of a more refined nesting season (December 15 through June 30).

Leases containing potential habitat for special status plant species, including Federally-listed and candidate species as well as those ranked as critically imperiled (S-1) and imperiled (S-2) by the Mississippi Natural Heritage Program (MNHP), would require botanical surveys prior to surface-disturbing activities. Operations would be excluded from areas supporting these special status plant species. This stipulation is expected to protect most naturally occurring glades, prairies, and other habitats which support special status plant species. The potential acreage affected by this stipulation is not available. This stipulation would be applied on a case-by-case basis based on site inspections conducted prior to leasing.

Impacts from Recreation and Travel Management Actions

Limiting the Hancock County Marshes tract to motorized boating would prevent damage to sensitive coastal habitats for tiny-leaved buckthorn and Mississippi diamondback by limiting disturbance to species and their habitats. It would also retain the secluded nature of this barrier island and allow for undisturbed nesting and foraging of special status shorebirds, including royal tern.

Impacts from Lands and Realty Management Actions

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to special status species associated with ROW development compared to Alternative 1.

Wildland Fire Ecology and Management

Impacts from suppressing all wildland fires and allowing prescribed burning on a case-by-case basis would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

Undertaking actions to remove invasive plant species on the Hancock County tract would reduce the potential for changes in the marsh vegetation communities from invasive species. As a result, the natural fire regimes would be maintained or restored. This would improve the ability to manage wildland fire in its natural role through application of prescribed fires, as necessary. Undesired wildfires in the marsh vegetation communities that are within their natural fire regimes would also be safer and less expensive to suppress.

Impacts from Fish and Wildlife Habitat Management Actions

Conducting prescribed burns to improve habitat on the Hancock County tract would promote marsh health and allow for the reintroduction of wildland fire as a natural process and maintain or restore the natural fire regimes. Undesired wildfires in the marsh vegetation communities that are within their natural fire regimes would also be safer and less expensive to suppress.

Impacts from Minerals Management Actions

Impacts to wildland fire ecology and management from anticipated oil and gas development and associated disturbance of 55 acres would be the same as Alternative 1. Impacts would not occur on the closed (63,004 acres) and NSO (184,192 acres) areas created through applying the stipulations in Appendix D.

Impacts from Recreation and Travel Management Actions

The Hancock County tract would be limited to motorized boating under this alternative. The potential for increased wildland fire occurrence would similar to Alternative 1 because the potential for travel ignition sources through human use is very low.

Impacts from Lands and Realty Management Actions

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as an avoidance area, there would be less potential for wildfire impacts associated with ROW development compared to Alternative 1. This would also decrease infrastructure needing protection, but would also decrease improvements in accessibility to fires and providing fire-breaks on these tracts.

Cultural Resources

Impacts from cultural resources management and wildland fire management actions would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

Undertaking actions to remove invasive plant species on the Hancock County tract would increase the potential for damage to cultural resource sites. Mechanical treatments are more likely to impact cultural resources than low intensity treatments such as chemical treatments or hand treatments. Vegetative communities management actions would require cultural resource inventories and clearance prior to ground disturbance to identify the presence of any cultural sites and avoid or mitigate any potential damage.

Impacts from Fish and Wildlife Habitat Management Actions

Conducting prescribed burns to improve habitat on the Hancock County tract would increase ground disturbance and associated potential impacts to cultural resources. Wildlife habitat manipulation would require cultural resource inventories and clearance prior to ground disturbance to identify the presence of any cultural sites and avoid or mitigate any potential damage.

Impacts from Minerals Management Actions

Cultural resources could be impacted by managing 270,615 acres of non-USFS FMO as open to leasing subject to standard lease terms and conditions and 123 acres of non-USFS FMO as CSU. Based on the RFD, oil and gas developments within these areas would impact 55 acres through the development of 10 wells over 20 years. Development on these acres would typically be subject to Class III cultural resource inventories and evaluation on a project-by-project basis prior to allowing disturbance, resulting in the identification and potential excavation of cultural sites. Stipulations and BMPs applied under this alternative would protect and preserve cultural resources on the 184,192 acres managed as NSO and in areas where surface disturbance would be precluded (63,004 acres).

Impacts from Recreation and Travel Management Actions

Although the tract would be limited to motorized boating under this alternative, the level of activity that could impact cultural resources would not be anticipated to change compared to Alternative 1 since the tract is not anticipated to be used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Managing the Hancock County tract as a ROW avoidance area would reduce the potential for ground disturbance and potential impacts to cultural resources associated with ROW development compared to Alternative 1. Construction of development within a ROW could result in inadvertent damage if cultural resources that were undetected during surveys were unearthed during ground-disturbing activities. Following discovery of cultural resources, activities would stop in accordance with terms and conditions in the ROW grant which would minimize further damage to cultural resources.

Visual Resources

Impacts from Vegetative Communities Management Actions

Undertaking actions to improve vegetation communities, such as removing invasive species, on the Hancock County tract would temporarily diminish visual quality. Visual quality would be improved in the long term as the condition of vegetation communities improve to meet VRM class objectives.

Impacts from Fish and Wildlife Habitat Management Actions

Undertaking actions to improve fish and wildlife habitat on the Hancock County tract, such as prescribed burning, would temporarily diminish visual quality if the developments were to dominate the view of the casual observer. Visual quality would be improved in the long term as wildlife-related recreation and habitat conditions were improved.

Impacts from Minerals Management Actions

Since approximately 55 acres of vegetation removal and construction activities would result from the development of 10 oil and gas wells (as with Alternative 1), impacts would be the same as Alternative 1. Stipulations applied under this alternative could protect visual resources on the 184,192 acres managed as NSO and in areas where development would be precluded (63,004 acres).

Impacts from Recreation and Travel Management Actions

Continuing to allow recreation use on the Hancock County tract would result in impacts similar to those described under Alternative 1. Since the tract would be managed as limited to motorized boating, impacts to visual quality would be diminished as there would be less potential for vegetation and soil removal from these activities. Furthermore, because the tract is not currently used extensively for recreation, this impact would be minimal.

Impacts from Lands and Realty Management Actions

Managing the Hancock County tract as a ROW avoidance area would retain the visual quality in the undeveloped wetland setting since ROWs would not be approved on the tract unless it met resource objectives.

Minerals

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Minerals Management Actions

Applying the lease stipulations and BMPs in Appendix D could restrict or preclude oil and gas development and exploration. Impacts would not be anticipated on approximately 270,615 acres open to leasing, subject to standard lease terms and conditions. Managing approximately 123 acres as open to leasing, subject to minor constraints and 184,192 acres as open to leasing, subject to major constraints could increase development costs. Closing 63,004 acres to leasing would not affect oil and gas leasing because approximately five percent of the closed areas would be in areas of historical oil and gas production. Allowing for exceptions, waivers, and modifications to these stipulations could create opportunities for the discovery of new oil and gas resources.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Lands and Realty Management Actions

Lands and realty management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Recreation and Travel Management

Impacts from Vegetative Communities Management Actions

Undertaking actions to improve vegetation communities, such as removing invasive species, on the Hancock County tract would temporarily diminish the recreation experience or eliminate the recreation opportunity since recreationists could be displaced from vegetation treatment areas until revegetation occurs. The recreation experience and opportunity would be improved in the long term as the condition of vegetation communities improve by improving the long-term aesthetics of an area.

Impacts from Fish and Wildlife Habitat Management Actions

Undertaking actions to improve wildlife habitat on the Hancock County tract, such as prescribed burning, would temporarily diminish or eliminate the recreation experience and opportunities for travel since recreationists could be displaced from protected areas or treated areas until revegetation occurs. The recreation experience would be improved in the long term as wildlife-related recreation and habitat conditions are improved by improving the long term aesthetics and wildlife viewing of an area.

Impacts from Minerals Management Actions

Since approximately 55 acres of vegetation removal and construction activities would result from the development of 10 oil and gas wells (as with Alternative 1), impacts would be the same as Alternative 1. Stipulations applied under this alternative could protect the recreational opportunities on the 184,192 acres managed as NSO and in areas where development would be precluded (63,004 acres) by precluding ground disturbance and infrastructure associated with oil and gas development.

Impacts from Recreation and Travel Management Actions

Continuing to allow recreation use on the Hancock County tract would result in impacts similar to those described under Alternative 1. Since motorized vehicle use would be limited to motorized boating, motorized recreationists opportunities would be maintained. Since the tract is not currently used extensively for recreation or motorized travel, this anticipated impact would be minimal.

Impacts from Lands and Realty Management Actions

Managing the Hancock County tract as a ROW avoidance area would retain the recreation experience in the undeveloped wetland setting since ROWs would not be approved on the tract unless it met resource objectives.

Lands and Realty

Under Alternative 2, the 174-acre Hancock County tract would be managed as a ROW avoidance area. This could impose design and siting requirements and associated costs on new ROW. There would be an increased potential for requests for new ROW to be denied if the ROW did not meet resource objectives of the tract.

Retaining the Hancock County tract under BLM administration and pursuing partnerships with other agencies and organizations could allow for management opportunities for other agencies and organizations, but would not allow for non-Federal ownership opportunities. Partnerships would allow for more efficient and comprehensive resource management of the surface tracts.

Social and Economic

Impacts from Vegetative Communities Management Actions

This alternative includes the removal of invasive species on the Hancock County tract. Impacts from these actions on the socioeconomic indicators would not be anticipated from these types of vegetative communities management actions.

Impacts from Fish and Wildlife Habitat Management Actions

Impacts to social and economic conditions from fish and wildlife habitat management actions would be the same as impacts identified from vegetative communities management actions.

Impacts from Minerals Management Actions

The same number of wells and acres of surface disturbance is anticipated under this alternative; however, this alternative would apply leasing stipulations to protect sensitive species and their habitats, including buffers for wetland and aquatic resources. Relative to Alternative 1, the exploration and development costs could increase while the availability for locations for well pads could decrease. This alternative would also provide for the greatest amount of protection for wetland resources. Since the number of wells anticipated is small relative to total wells in the area, there would be minimal changes as compared with the current situation, possibly slight increases in employment or income (and the same as Alternative 1). Social indicators such as housing, education, and cost of living would not be anticipated to change under this alternative.

Similar disturbances from oil and gas development would occur as compared to Alternative 1, although potential impacts to wetlands, soils, vegetation, habitat, and wildlife would be anticipated to be reduced under this alternative due to the implementation of NSO conditions on oil and gas leasing. Oil and gas development and production can have implications for visual and scenic qualities as well as property values. These impacts are likely less than those under Alternative 1, as there are more conditions and constraints on well-pad locations under Alternative 2. Industry costs and availability for well pad locations would likely increase under this alternative, which would result in adverse impacts for the oil and gas industry.

Impacts from Recreation and Travel Management Actions

Under this alternative, the surface tract would be open to recreational use, but designated as limited to motorized boating. Social and economic conditions would be similar to Alternative 1 since minimal changes in recreation and travel management are anticipated. However, OHV users would likely be adversely impacted since the tract would not be available for this type of motorized use.

Impacts from Lands and Realty Management Actions

ROW management actions and associated impacts to social and economic conditions would be the same as Alternative 1.

Hazardous Materials

Impacts would be the same as Alternative 1.

4.3.3 Alternative 3 (Preferred Alternative)

Air Quality

Under this alternative, there is a potential for wildfire which could lead to air emissions. Since all fires would be suppressed, these occurrences would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated air emissions would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

ROW management actions and associated impacts would be the same as Alternative 2.

Soil Resources

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated impacts on 55 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (3,021 acres), and NSO (92,269 acres) restrictions would be implemented, which would reduce disturbance to soils within the protected areas. Under this alternative, the NSO area around aquatic habitats identified in Alternative 2 would be reduced to 250-feet, which would reduce protections to soils within these areas as compared to Alternative 2. Impacts to prime or unique farmlands would be the same as described for Alternative 1.

Impacts from Recreation and Travel Management Actions

Although travel management would be limited to motorized boating under this alternative, the level of activity that could increase erosion would not be anticipated to change compared to Alternative 1 since these tracts are not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to soils associated with ROW development compared to Alternative 1.

Water Resources

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated impacts on 55 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (3,021 acres), and NSO (92,269 acres) restrictions would be implemented, which would reduce disturbance to water resources within the protected areas. Under this alternative, the NSO area around aquatic habitats identified in Alternative 2 would be reduced to 250-feet, which would allow development to occur in close proximity to water resources and the potential for impacts to water resources to occur.

Impacts from Recreation and Travel Management Actions

Although travel management would be limited to motorized boating under this alternative, the level of activity that could impact water resources would not be anticipated to change compared to Alternative 1. Therefore, the impacts would be the same as Alternative 1.

Impacts from Lands and Realty Management Actions

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as an avoidance area, there would be less potential for impacts to water resources associated with ROW development compared to Alternative 1.

Vegetative Communities

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Impacts to vegetation would be similar to Alternative 1; however, under this alternative, oil and gas activities would be excluded from a 250-foot buffer around wetlands and aquatic habitats, karst areas, shoreline habitats and habitats like naturally occurring prairies and glades with special status species. There is the option of increasing the buffer to 600-feet where needed because of slopes over 10 percent or erosive soils. The buffer under this alternative is expected to be sufficient to protect wetland and riparian vegetation and most naturally occurring glades and prairies. Impacts to exotic invasive plant species would be the same as in Alternative 1.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Under this alternative, the Hancock County tract would be available for disposal; however, future management of the tract would be constrained to meet the same resource objectives as under Alternative 2 and so impacts to vegetative communities are not anticipated.

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to vegetative communities associated with ROW development compared to Alternative 1.

Fish and Wildlife

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Impacts would be similar to those discussed under Special Status Species. The acreage disturbed (55) would be same, but wells would be shifted away from sensitive habitats. Under this alternative, the buffer would be reduced to 250-feet, with the option of increasing it to 600-feet where needed because of steep slopes or erosive soils. The buffer could be reduced to 100-feet where slopes are less than 10 percent and there are no Special Status Species issues. These buffers are expected to be sufficient for most wildlife species, utilizing wetland and aquatic habitats, but interior forest nesting birds and some amphibians and reptiles that range farther from the riparian/wetland zone would be adversely impacted by this reduced buffer through habitat disturbance. Karst habitats and most naturally occurring prairies and glades would be protected under this alternative.

Under this alternative, the coastal no lease areas, including sea turtle nesting habitat and shorelines suitable for least tern, piping plover, and snowy plover would be replaced with an NSO buffer. This change has some potential to promote offsite drilling. Loss of even small acreages of maritime forests or shrub lands would result in the loss of important foraging habitats for migrating song-birds, wading-birds and shore-birds, as well as other species associated with these critically imperiled habitats.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Under this alternative, the Hancock County tract would be available for disposal; however, future management of the tract would be constrained to meet the same resource objectives as under Alternative 2 and so impacts to fish and wildlife are not anticipated.

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to fish and wildlife associated with ROW development compared to Alternative 1.

Special Status Species

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

The number of wells (10) and acres disturbed (55) would remain the same under this alternative and impacts would be the same as Alternative 2, except in the following situations. The aquatic and wetland buffer would be reduced to 250-feet. In areas where slopes exceed 10 percent, the buffer could be extended up to 600-feet to provide adequate protection. In areas with slopes less than 10 percent, the 250-foot buffer could be reduced to a minimum of 100-feet, if the adjacent waterway or wetlands have been surveyed and no special status species occur within 100-yards upstream and 300-yards downstream of the site. This stipulation could be applied to an estimated 68,656 acres or 13 percent of the non-USFS FMO available for leasing in Mississippi. In most cases, this buffer is expected to prevent construction activities from increasing the sedimentation of local drainages and wetlands. In areas with slopes over 25 percent, additional measures may be needed to stabilize disturbed soils above wetlands or aquatic habitats.

Under this alternative, the no lease area along the coast would be replaced with a NSO buffer. Although no surface disturbance would occur on non-USFS FMO or BLM surface tracts within this buffer, offsite directional drilling to target these Federal minerals would be permitted under this alternative. Any directional drilling targeting non-USFS FMO may affect Federally- or State-listed species using this coastal area, including piping plover, snowy plover, Wilson’s plover and American oystercatcher.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to special status species associated with ROW development compared to Alternative 1.

Wildland Fire Ecology and Management

Impacts from suppressing all wildland fires and allowing prescribed burning on a case-by-case basis would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Impacts to wildland fire ecology and management from anticipated oil and gas development and associated disturbance of 55 acres would be the same as Alternative 1. Impacts would not occur on the closed (63,004 acres) and NSO (92,269 acres) areas created through applying the stipulations in Appendix D.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

ROW management actions and associated impacts would be the same as Alternative 2.

Cultural Resources

Impacts from cultural resources management and wildland fire management actions would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Impacts to cultural resources from management of non-USFS FMO would be the same as Alternative 2, except 259,640 acres would be managed as open to leasing subject to standard lease terms and conditions, 3,021 acres as CSU, 92,269 acres as NSO, and 63,004 acres as closed. The 55 acres of disturbance resulting from the anticipated 10 wells could impact cultural resources within areas managed as open to leasing subject to standard lease terms and conditions or CSU. Impacts to cultural resources are not anticipated in areas managed as NSO or closed since surface disturbance would be precluded.

Impacts from Recreation and Travel Management Actions

Although the Hancock County tract would be managed as limited to motorized boating under this alternative, the level of activity and associated impacts to cultural resources would not be anticipated to change compared to Alternative 1 since the tract is not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Management actions and impacts associated with ROW development would be the same as Alternative 2.

Visual Resources

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Since approximately 55 acres of vegetation removal and construction activities would result from the development of 10 oil and gas wells (as with Alternative 1), impacts would be similar to Alternative 1. Stipulations applied under this alternative could preclude oil and gas development thereby protecting visual resources on the 92,269 acres managed as NSO and in areas where development would be precluded (63,004 acres). Since no mineral development activities would occur on the surface tracts, there would be no violations of VRM class objectives.

Impacts from Recreation and Travel Management Actions

Recreation and travel managements actions and associated impacts to visual resources would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

ROW management actions and associated impacts would be the same as Alternative 2.

Minerals

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Minerals Management Actions

Applying the lease stipulations and BMPs in Appendix D could restrict or preclude oil and gas development and exploration. Under this alternative, the NSO area around aquatic habitats identified in Alternative 2 would be reduced to 250 feet and the no lease stipulation for Alabama beach mouse habitat would be NSO. Impacts would not be anticipated on approximately 259,640 acres open to leasing, subject to standard lease terms and conditions. Managing approximately 3,021 acres as open to leasing, subject to minor constraints and 92,269 acres as open to leasing, subject to major constraints could increase development costs. Closing 63,004 acres to leasing would not affect oil and gas leasing because approximately five percent of the closed areas would be in areas of historical oil and gas production. Allowing for exceptions, waivers, and modifications to these stipulations (Appendix D) could create opportunities for the discovery of new oil and gas resources.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Lands and Realty Management Actions

Lands and realty management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Recreation and Travel Management

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts to recreation and travel would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions and associated impacts to recreation and travel would be the same as Alternative 2.

Impacts from Minerals Management Actions

Since approximately 55 acres of vegetation removal and construction activities would result from the development of 10 oil and gas wells (as with Alternative 1), impacts would be the same as Alternative 1. Stipulations applied under this alternative could indirectly protect the recreational opportunities on the 92,269 acres managed as NSO and in areas where development would be precluded (63,004 acres) by eliminating associated ground disturbances, noise, and infrastructure.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

ROW management actions and associated impacts to recreation and travel would be the same as Alternative 2.

Lands and Realty

Lands and realty management actions and associated impacts to lands and realty would be the same as Alternative 2.

Social and Economic

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts to social and economic conditions would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Impacts to social and economic conditions from fish and wildlife habitat management actions would be the same as impacts identified from vegetative communities management actions.

Impacts from Minerals Management Actions

The same number of wells and acres of surface disturbance as Alternative 1 is anticipated under this alternative; however, this alternative applies leasing stipulations to protect sensitive species and their habitats, including buffers for wetland and aquatic resources. Relative to Alternative 1, the exploration and development costs could increase while the availability for locations of well pads could decrease, resulting in adverse impacts to the oil and gas industry. Since the number of wells anticipated is small relative to total wells in the area, there would be minimal social and economic changes, possibly slight increases in employment or income, as compared with the current situation. Oil and gas development and production can have implications for visual and scenic qualities as well as property values. These impacts are likely less than those under Alternative 1, as there are more conditions and constraints on well-pad locations under Alternative 3. Social indicators such as housing, education, and cost of living would not be anticipated to change under this alternative.

Impacts from Recreation and Travel Management Actions

Under Alternative 3, socioeconomic impacts would be the same as those identified under Alternative 2.

Impacts from Lands and Realty Management Actions

ROW management actions and associated impacts to social and economic conditions would be the same as Alternative 1.

Hazardous Materials

Impacts would be the same as Alternative 1.

4.3.4 Alternative 4

Air Quality

Under this alternative, there is a potential for wildfire which could lead to air emissions. Since all fires would be suppressed, these occurrences would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground disturbing activities of a severity or extent that would deteriorate air quality conditions. Prescribed burning conducted to meet vegetation resource objectives would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground disturbing activities of a severity or extent that would deteriorate air quality conditions. Prescribed burning conducted to meet habitat objectives would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated air emissions would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

ROW management actions and associated impacts would be the same as Alternative 2.

Soil Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in disturbance or loss of soils.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in disturbance or loss of soils.

Impacts from Minerals Management Actions

Impacts to soil resources from oil and gas development would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Although the Hancock County tract would be limited to motorized boating under this alternative, the level of activity that increase erosion would not be anticipated to change compared to Alternative 1 since the tract is not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Disposing the tract from Federal ownership with no restrictive covenants could increase chances for subsequent development and associated impacts to soil resources. However, given this tract's remoteness and location in the Hancock County Marshes Coastal Preserve, development would not be anticipated.

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to soils associated with ROW development compared to Alternative 1.

Water Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to water quality.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to water quality.

Impacts from Minerals Management Actions

Impacts to water resources from minerals management, including oil and gas and coal development, would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Although the Hancock County tract would be limited to motorized boating under this alternative, the level of activity that impact water resources would not be anticipated to change compared to Alternative 1 since the tract is not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Disposing the tract from Federal ownership with no restrictive covenants could increase chances for subsequent development and associated impacts to water resources. However, given this tract's remoteness and location in the Hancock County Marshes Coastal Preserve, development would not be anticipated.

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to water resources associated with ROW development compared to Alternative 1.

Vegetative Communities

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could result in increased potential for invasive/exotic species becoming established or spreading. This is particularly true of the higher elevations of the Hancock County tract located on Point Clear Island. Cogon grass and Chinese tallow are both known to occur in the area and if uncontrolled could substantially alter the vegetative communities. Dense stands of cogon grass would displace native vegetation and could make the island and adjacent marshes more vulnerable to frequent wildfires.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under impacts from vegetative communities management actions.

Impacts from Minerals Management Actions

Minerals management actions and associated impacts would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Disposing the tract from Federal ownership with no restrictive covenants could increase chances for subsequent development and associated impacts to vegetative communities. However, given this tract's remoteness and location in the Hancock County Marshes Coastal Preserve, development would not be anticipated.

Fish and Wildlife

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could result in habitat degradation on any of the BLM surface tracts. The Hancock County tract located on Point Clear Island is particularly vulnerable to Cogon grass and Chinese tallow.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under impacts from vegetative communities management actions.

Impacts from Minerals Management Actions

Minerals management actions and associated impacts would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Disposing the tract from Federal ownership with no restrictive covenants could increase chances for subsequent development and associated impacts to vegetative communities. However, given this tract’s remoteness and location in the Hancock County Marshes Coastal Preserve, development would not be anticipated. Management of wildlife values is expected to continue in coordination with the Mississippi Coastal Preserve System.

Special Status Species

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could result in increased potential for invasive/exotic species becoming established or spreading. This is particularly true of the higher elevations of the Hancock County tract located on Point Clear Island. Cogon grass and Chinese tallow are both known to occur in the area and if uncontrolled could substantially alter the habitats supporting Mississippi diamondback terrapin and tiny-leaved buckthorn. Dense stands of cogon grass would displace native vegetation and could make the island and adjacent marshes more vulnerable to frequent wildfires.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under impacts from vegetative communities management actions.

Impacts from Minerals Management Actions

Minerals management actions and associated impacts would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Under this alternative, the Hancock County tract would be available for disposal from Federal ownership. The effect this has on special status species is not known. Its location at the center of the Hancock County Marsh Preserve and the presence of extensive wetlands would make development of the tract difficult. It is likely that special status species would continue to benefit from the tract being managed in coordination with the Mississippi Coastal Preserve System.

Wildland Fire Ecology and Management

Impacts from suppressing all wildland fires and allowing prescribed burning on a case-by-case basis would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

Although no specific vegetative communities actions are proposed, allowing vegetation manipulation to meet resources objectives under standard management common to all alternatives would generally serve to decrease vegetation density and cover (fuel load) and maintain natural fuel conditions across the Hancock County tract. This would maintain natural disturbance regimes which would be easier to manage through prescribed fire or other treatments. This would also decrease the frequency and intensity of wildland fires and allow fires to be more easily controlled, better protecting life, public safety, and property and resource values. However, lack of specific areas and species being managed could result in invasions and fuel accumulations that would increase the frequency and intensity of wildland fires.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative, therefore no impacts would be anticipated. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would result in impacts similar to those discussed under impacts from vegetative communities management actions.

Impacts from Minerals Management Actions

Minerals management actions and associated impacts to wildland fire ecology and management would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Impacts to wildland fire ecology and management from recreation and travel management actions would be the same as Alternative 2 because travel designations would be the same for this alternative.

Impacts from Lands and Realty Management Actions

ROW management actions and associated impacts would be the same as Alternative 2.

Cultural Resources

Impacts from cultural resources management and wildland fire management actions would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would require cultural resource clearances before activity were to occur; therefore, impacts would not be anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would require cultural resource clearances before activity were to occur; therefore, impacts would not be anticipated.

Impacts from Minerals Management Actions

Minerals management action and associated impacts to cultural resources would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Although the Hancock County tract would be limited to motorized boating under this alternative, the level of activity and associated potential impacts to cultural resources would not be anticipated to change compared to Alternative 1 since these tracts are not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Making the Hancock County tract available for disposal without any specified management or use conditions could have impacts if the property contained previously undetected, potentially eligible NRHP cultural sites. Disposing the property from Federal ownership would remove the protection of any cultural resources under Federal law, and not applying management or use conditions would increase the potential for damage of previously undetected cultural resources. Before any transfer of management responsibilities or ownership, a cultural resource survey and consultation with SHPO under NHPA Section 106 regulations would be required, mitigating this impact.

Management actions and impacts associated with ROW development would be the same as Alternative 2.

Visual Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to visual quality. Although visual quality would deteriorate in the short term, visual quality would improve in the long term once vegetation has reestablished to meet VRM class objectives.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to visual quality. Although visual quality would deteriorate in the short term, visual quality would improve in the long term once vegetation has reestablished to meet VRM class objectives.

Impacts from Minerals Management Actions

Minerals management actions and associated impacts to visual resources would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel managements actions and associated impacts to visual resources would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Making the Hancock County tracts available for disposal from Federal ownership without any specified management or use conditions if the R&PP were revoked could result in changes to the existing natural or manmade landforms, which would diminish visual quality if the use were to dominate the view of the casual observer. Following disposal, private development actions could create visually intrusive development.

ROW management actions and associated impacts would be the same as Alternative 2.

Minerals

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Minerals Management Actions

Mineral management actions for oil and gas and associated impacts would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Impacts from Lands and Realty Management Actions

Lands and realty management actions would not restrict or preclude mineral development and exploration, therefore impacts are not anticipated.

Recreation and Travel Management

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to recreation.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground disturbing activities of a severity or extent that would result in impacts to recreation.

Impacts from Minerals Management Actions

Minerals management actions and associated impacts to recreation and travel would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Making the Hancock County tract available for disposal from Federal ownership without any specified management or use conditions if the R&PP were revoked could result in reduced access for recreation and travel opportunities. Following disposal, the tract could be made unavailable for public recreation and become inaccessible.

Lands and Realty

ROW management actions and associated impacts to lands and realty would be the same as Alternative 2. Under Alternative 4, the 174-acre Hancock County tract would be available for disposal from Federal ownership with no restrictive covenants. This would allow for opportunities for other Federal agency or non-Federal ownership without specified conditions on future use of the tract; however, disposal would not be allowed if it would jeopardize Federally-listed species or designated critical habitat, which could limit some disposals.

Social and Economic

Impacts from Vegetative Communities Management Actions

Impacts to social and economic conditions would not be anticipated from vegetative communities management actions since no actions are proposed under this alternative. Standard management actions common to all alternatives, which would allow vegetation manipulation to meet resource objectives, would not be anticipated to be of an extent that would result in impacts to economic or social conditions.

Impacts from Fish and Wildlife Habitat Management Actions

Impacts to social and economic conditions would not be anticipated from fish and wildlife habitat management actions since no actions are anticipated. Standard management actions common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to be of an extent that would result in impacts to economic or social conditions.

Impacts from Minerals Management Actions

Minerals management actions and the associated impacts to social and economic conditions would be the same as those under Alternative 3.

Impacts from Recreation and Travel Management Actions

Under Alternative 4, socioeconomic impacts would be the same as those identified under Alternative 2.

Impacts from Lands and Realty Management Actions

Under Alternative 4, the Hancock County land tract would be available for disposal from Federal ownership without conditions on management and use after disposal. This could result in reduced access for recreational opportunities on these lands. Since development could be allowed on these properties, it is possible that the property tax revenues to the local counties would increase more than the Federal Payments in Lieu of Taxes, economically benefiting Hancock County and the State. It is possible that the private development of these tracts could slightly increase employment and income in these areas. Social indicators, such as housing, education, and cost of living are not expected to be influenced by the minimal development.

Hazardous Materials

Impacts would be the same as Alternative 1.

4.4 CUMULATIVE IMPACTS

Cumulative impacts analysis considers the alternatives in the context of the broader human environment—specifically, actions that occur outside the scope and geographic area covered by the RMP-EIS. The following factors are considered in the cumulative impact assessment: Federal, non-Federal, and private actions; the potential for synergistic effects or synergistic interaction among or between effects; the potential for effects to cross political and administrative boundaries; other spatial and temporal characteristics of each affected resource; and the comparative scale of cumulative impacts across alternatives.

Past, present, and potential future actions are considered in the analysis to identify whether the environment has been degraded or enhanced, and to what extent; whether ongoing activities are causing impacts; and trends for activities and impacts in the area. Projects and activities are evaluated on the basis of proximity, connection to the same environmental systems, potential for subsequent impacts or activity, similar impacts, the likelihood a project will occur, and whether the project is reasonably foreseeable. Projects and activities considered in the cumulative analysis were identified through discussions with agency officials and review of publicly available materials and Web sites. The following projects and activities were identified:

- **Mineral Development:** Between 1983 and 2004, 8,068 wells have been completed in Alabama. Of those, 17 wells were drilled to BLM-administered non-USFS FMO. BLM currently oversees 30 active leases on BLM-administered non-USFS FMO and 106 active leases on USFS FMO in Alabama. An estimated 20 wells (105 acres of surface disturbance) could be developed on non-USFS BLM-administered FMO lands in Alabama over the next 20 years. An estimated 4,000 wells (20,811 acres of surface disturbance) could be developed on non-Federal and USFS lands in Alabama over the next 20 years. Future anticipated well development in Alabama is shown in Table 4-5.

Table 4-5. Future Anticipated Well Development In Alabama

	Federal (non-USFS)	Federal (USFS)	Non-Federal	Total
Number of Wells	20	12	3,988	4,020
Total Acres of Surface Disturbance	105	61	20,750	20,916

Between 1983 and 2004, 7,362 wells have been completed in Mississippi. Of those, seven wells were drilled to BLM-administered non-USFS FMO, two of which were drilled from other Federal agency surface ownership and five from non-Federal surface ownership. BLM currently oversees 42 active leases on BLM-administered non-USFS FMO and 1,181 active leases on USFS FMO in Mississippi. An estimated 10 wells (55 acres of surface disturbance) could be developed on non-USFS BLM-administered FMO lands in Mississippi over the next 20 years. An estimated 12,000 wells (59,745 acres of surface disturbance) could be developed on non-Federal and USFS lands in Mississippi over the next 20 years. Future anticipated well development in Mississippi is shown in Table 4-6.

Table 4-6. Future Anticipated Well Development In Mississippi

	Federal (non-USFS)	Federal (USFS)	Non-Federal	Total
Number of Wells	10	350	11,650	12,010
Total Acres of Surface Disturbance	55	1,925	57,820	59,800

- **Coal development.** For the purposes of this analysis, new Federal coal leases of 9,000 acres could be anticipated. Approximately 37.6 million tons of Federal coal would be produced over the next 20 years (avg. 1.9 tons/yr.) as part of pre-existing underground mines with no new surface disturbance.
- **Potential development after disposal of the surface tracts.** For the purposes of the cumulative impact analysis, assumptions were made as to the potential development of the surface tracts following disposal for Alternatives 3 and 4.

  Under Alternative 3, the Jordan Lake tract would likely be developed as a recreation camp following disposal. No development would be expected following disposal of the Geneva County tract.

  Under Alternative 4, the Fort Morgan Beach, Fort Morgan Highway, and Fowl River tracts would be developed for residential or recreational use. The Coosa River and Jordan Lake tracts would be developed as recreation camps following disposal. No development would be expected following disposal of the Geneva County tract.

  Under Alternatives 3 and 4, the Hancock Country tract in Mississippi would continue to be used for recreation and research site purposes with no expected development.
- **Fuels Treatments.** Table 4-7 shows the fuels treatments completed in Alabama by Department of the Interior agencies and USFS. The BLM did not conduct any fuels treatments in Alabama over these four years. Over 98 percent of these treatments were completed by the USFS using prescribed fires approximately 90 percent of the time; the remainder were completed with mechanical treatments. Over 97 percent of Federal fuels treatments were applied in WUI areas.

Table 4-7. DOI and USDA Fuels Treatment Accomplishments for Alabama (Acres)

Year	Wildland-Urban Interface			Other			Total
	Fire	Mechanical	Total	Fire	Mechanical	Total	
2006	69,112	3,602	72,714	3,529	5,190	8,719	81,433
2005	84,804	12,313	97,117	157	282	439	97,556
2004	82,391	6,336	88,727	0	0	0	88,727
2003	76,884	16	76,900	0	0	0	76,900

Source: http://www.fireplan.gov/overview/States/al.html, accessed March 2, 2007

Table 4-8 shows the fuels treatments completed in Mississippi by Department of the Interior agencies and USFS. The BLM did not conduct any fuels treatments in Mississippi over these four years. Over 95 percent of these treatments were completed by the USFS using prescribed fires approximately 80 percent of the time; the remainder were completed with mechanical treatments. Over 96 percent of Federal fuels treatments were applied in WUI areas.

Table 4-8. DOI and USDA Fuels Treatment Accomplishments for Mississippi (Acres)

Year	Wildland-Urban Interface			Other			Total
	Fire	Mechanical	Total	Fire	Mechanical	Total	
2006	101,385	117,052	218,437	2,847	846	3,693	222,130
2005	256,138	18,879	275,017	10,312	27	10,339	285,356
2004	251,924	10,496	262,420	16,820	672	17,492	279,912
2003	264,855	605	265,460	6,598	466	7,064	272,524

Source: http://www.fireplan.gov/overview/States/ms.html, accessed March 2, 2007

- **Soil disturbance and vegetation loss from construction projects.** Other construction projects across the State including private development and transportation projects create soil disturbance and vegetation loss. The 1997 and 2003 National Resources Inventories (NRIs) provide for estimates of land use conversion over time. Surface disturbance for oil and gas development would be comparable to the NRI category of “Developed Land.” Comparison with the NRI data will put the proposed actions of the AL-MS RMP (e.g. the oil and gas RFD) in context for cumulative impact analysis. The information from the 1997 NRI (including data for the period 1982-1997) and the 2003 NRI is briefly described below and is shown in Table 4-9. The increase in developed land over time can be seen by scanning down the “Developed” land column.

  The 1997 NRI data indicates that the acres of developed land in Alabama increased by 635,700 acres from 1982 to 1997, an average of 42,380 acres per year. The 2003 NRI shows that Developed Land increased to 2,273,900 acres in Alabama by 2003. This is an increase of 471,600 acres for the 6-year period 1997-2003, an annual average of 78,600 acres.

  The 1997 NRI data indicates that the acres of developed land in Mississippi increased by 353,800 acres from1982-1997, an average of 23,587 acres per year. The 2003 NRI shows that Developed Land increased to 1,676,300 acres in Mississippi by 2003. This is an increase of 202,300 acres for the 6-year period 1997-2003, an annual average of 33,717 acres.

Table 4-9. Developed Surface Area of Non-Federal and Federal Land and Water Areas, By State and Year (Data per 1,000 acres)

State	Year	Federal land	Water areas	Non-Federal land			Total Surface Area
				Developed	Rural	Total	
Alabama	1982	949.3	1,166.8	1,616.6	29,691.1	31,307.7	33,423.8
	1987	950.1	1,181.4	1,807.2	29,485.1	31,292.3	33,423.8
	1992	970.0	1,201.0	1,937.0	29,315.8	31,252.8	33,423.8
	1997	997.9	1,223.2	2,252.3	28,950.4	31,202.7	33,423.8
	2003	997.9	1,281.4	2,723.9	28,420.6	31,144.5	33,423.8
Mississippi	1982	1,634.6	720.5	1,120.2	27,052.0	28,172.2	30,527.3
	1987	1,673.5	791.4	1,193.1	26,869.3	28,062.4	30,527.3

State	Year	Federal land	Water areas	Non-Federal land			Total Surface Area
				Developed	Rural	Total	
	1992	1,751.9	829.8	1,267.6	26,678.0	27,945.6	30,527.3
	1997	1,769.7	855.0	1,474.0	26,428.6	27,902.6	30,527.3
	2003	1,794.8	884.3	1,676.3	26,171.9	27,848.2	30,527.3

Notes: The following are definitions from the NRI:

Developed land. A combination of land cover/use categories, Large urban and built-up areas, Small built-up areas, and Rural transportation land.

Large urban and built-up areas. A Land cover/use category composed of developed tracts of at least 10 acres—meeting the definition of Urban and built-up areas.

Rural transportation land. A Land cover/use category which consists of all highways, roads, railroads and associated ROW outside urban and built-up areas; also includes private roads to farmsteads or ranch headquarters, logging roads, and other private roads (field lanes are not included).

Small built-up areas. A Land cover/use category consisting of developed land units of 0.25 to 10 acres, which meet the definition of Urban and built-up areas.

Urban and built-up areas. A Land cover/use category consisting of residential, industrial, commercial, and institutional land; construction sites; public administrative sites; railroad yards; cemeteries; airports; golf courses; sanitary landfills; sewage treatment plants; water control structures and spillways; other land used for such purposes; small parks (less than 10 acres) within urban and built-up areas; and highways, railroads, and other transportation facilities if they are surrounded by urban areas. Also included are tracts of less than 10 acres that do not meet the above definition but are completely surrounded by Urban and built-up land. Two size categories are recognized in the NRI: areas of 0.25 acre to 10 acres, and areas of at least 10 acres.

Sources: USDA, 2000; USDA, 2007.

4.4.1 Cumulative Impacts from BLM Management Actions in Alabama

Air Quality

The cumulative impacts of air quality are evaluated by comparing the BLM site emissions with regionwide emissions. For the State of Alabama, comprehensive emissions are only available for NO_X, CO, and VOCs in the major urbanized areas. These emissions can be obtained from the ADEM. Using the best available information from ADEM, Table 4-10 shows a comparison between the Birmingham Non Attainment Area and the BLM induced emissions. Based on this data, emissions from activities associated with potential oil and gas development and minerals mining on BLM-administered non-USFS FMO tracts proposed in this RMP would not considerably contribute to cumulative air quality emissions within the region (presented in Table 4-10). Over the next 20 years, emissions from 20 wells would comprise less than 1 percent of the emissions associated with the estimated 4,000 wells that could be developed on non-Federal and USFS lands in Alabama. These impacts would be the same for all alternatives.

Table 4-10. Comparison of Potential BLM Emissions with Cumulative Emissions for Alabama (tons per year) [1, 2]

Well and Mine Locations	Emission Type/Pollutant		
	NO_x	CO	VOC
BLM-Administered FMO Estate in Alabama	171	219	73
Birmingham NAA	578,799	2,902,972	448,946

1. Compared with best available 2002 data from the Alabama Department of Environmental Management (ADEM 2005).
2. A combination of oil and gas and coal mining.

Soil Resources

In Alabama, the disturbance of a maximum of 105 acres from oil and gas development across the State of Alabama comprises less than one percent of the 20,811 acres of surface disturbance anticipated from oil and gas development on non-Federal and USFS lands over the next 20 years. Although more than 8,000 wells have been completed in Alabama since 1983, the minimal number of 20 additional wells identified in the reasonably foreseeable development scenario (RFDS) would have no long-term impacts to soil productivity and therefore would not contribute to significant cumulative effects. These impacts would be the same for all alternatives.

Possible soil impacts associated with vegetative communities, fish and wildlife habitat, and lands and realty management actions including ROW development and potential development after disposal on the 159 acres of surface tracts comprises less than one percent of the 78,600 acres disturbed annually (1997-2003) from other construction projects across the State including private development and transportation projects (as estimated by the NRI data). There would be more potential for soil disturbance impacts associated with vegetative communities and fish and wildlife habitat management actions proposed under Alternatives 2 and 3 as opposed to Alternatives 1 and 4 that do not propose any actions beyond standard management common to all alternatives. There would be more potential for soil disturbance impacts associated with ROW management actions under Alternative 1, which allows ROW development on all surface tracts, than Alternatives 2, 3, and 4, which designates 114 acres or 71 percent BLM surface ownership in Alabama as ROW avoidance areas. There would be more potential for soil disturbance impacts associated with potential development after disposal without conditions under Alternative 4 than Alternatives 1, 2, and 3, which either retains the tracts (Alternatives 1 and 2) or places restrictive covenants on the use after disposal (Alternative 3).

Water Resources

Water resources located on or adjacent to Alabama surface tracts could experience change as a result of mineral exploration and development or construction activities. However, the BMPs and stipulations identified in Appendix D would minimize irreversible and irretrievable commitment of resources and unavoidable adverse impacts. Impacts to water quality associated with possible ROW development and the disturbance of a maximum of 105 acres from oil and gas development across the State of Alabama comprises less than one percent of the 20,811 acres of surface disturbance anticipated from oil and gas development on non-Federal agency and USFS lands would not contribute to significant cumulative impacts to water resources within the State of Alabama. Although more than 8,000 wells have been completed in Alabama since 1983, the minimal number of 20 additional wells identified in the RFDS would have no long-term impacts to soil stability or water quality and would limit the likelihood of leakage of drill fluids, hazardous waste spills, or leakage from reserve pits (if established) that could impact surface water and groundwater quality. Thus, significant cumulative impacts would not be anticipated. Potential development after disposal on the 159 acres of surface tracts comprises less than one percent of the 78,600 acres disturbed annually (1997-2003) from other construction projects across the State including private development and transportation projects (as estimated by the NRI data).

Coal mining activities within the Warrior Basin would be expanded to include 9,000 acres of new coal leases that would yield an estimated average of 1.9 million tons of coal per year over the next 20-years. Although this increased mining would be limited to existing underground coal mines, the potential for groundwater contamination would cumulatively increase as a result of the increased mining activities. Migration of contaminants into the surrounding soils and aquifers could degrade groundwater quality and thereby affect wells and springs that may serve household and domestic uses. These impacts would be the same for all alternatives.

Vegetative Communities

The continuation of mineral development (totaling approximately 4,000 wells with 20,811 acres of surface disturbance) and soil disturbance and vegetation loss from other construction projects in the State (approximately 78,600 acres of surface disturbance annually) has a high potential of affecting vegetative communities, such as glades and prairies, that are sensitive to disruption and difficult to restore after surface disturbing activities. These activities also have the potential to introduce and promote the spread of invasive, exotic plant species.

Throughout the State, some vegetative communities, embedded in the larger forested landscape, are particularly sensitive to disruption and are difficult to restore after surface-disturbing activities. Many of these are restricted to a narrow range of soil types such as glades and prairies; others are sensitive to changes in hydrography, such as bogs, forested wetlands and seepage slope communities. Construction activities in these plant communities generally alter the site sufficiently to preclude the reestablishment of these communities in the foreseeable future. Also, because of the limited acreage of these vegetative communities, loss of even small acreages has a disproportionate effect on the plant diversity in an area.

Surface disturbing activities have the potential to introduce or promote the spread of invasive, exotic plant species. Impacts are dependent on the species planted during restoration activities and the management of the site during and following restoration. Restoration activities typically include seeding non-native grasses, such as annual rye (during the winter months) and Bahia or Bermuda grass (during the summer months) to provide a quick cover for disturbed soils. Including native species in the mix increases diversity and provides a more natural structure. If these areas are mowed following abandonment, these non-native grasses are expected to persist and dominate the site. If, however, the sites are replanted in pine or left unmowed, the areas can be expected to progress through old field type growth which is dominated by opportunistic native and non-native species alike. Ultimately, both Bahia and Bermuda grass are expected to become shaded out as a tree or heavy shrub layer becomes established. Japanese honeysuckle and Chinese privet can both persist in shaded situations.

Although effects to vegetative communities from surface disturbing activities and the introduction of invasive, exotic plant species would likely occur as a result of the reasonably foreseeable actions identified for this analysis, BLM activities would have a minimal contribution to these effects on plant communities due to the small amount of acreage that would be disturbed under BLM management alternatives and BLM policies on BMPs for mineral development reclamation and control of noxious, exotic species.

Fish and Wildlife

The continuation of mineral development (totaling approximately 4,000 wells with 20,811 acres of surface disturbance) and soil disturbance and vegetation loss from other construction projects across the State (approximately 78,600 acres of surface disturbance annually) has a high potential of affecting wildlife and associated habitat through displacement, habitat degradation, and direct habitat loss.

Impacts to many wildlife species from oil and gas development are localized and temporary. Most common game species and other mobile wildlife species avoid the well pad areas during construction and maintenance. Less mobile species are directly impacted and during the spring and early summer; this can include nesting neotropical birds. Habitat generalists, including most game species, tend to return to surrounding habitats after the well is completed and construction and maintenance activities have ceased.

Intermittent maintenance and inspection activities conducted on the established pad for the life of the well are not expected to alter the overall use of the area by wildlife. However, construction in high value habitats or in areas with more narrowly adapted wildlife species can alter the overall species diversity. Wells and roads in areas of contiguous forests increase habitat fragmentation, reducing the suitability of the area for interior nesting birds and making nests more susceptible to predation and parasitism. Older growth forests which provide habitat for interior forest nesting birds and a wider diversity of amphibians and reptiles are often located in riparian zones left as buffers during logging operations or in steeper, less accessible slopes.

Oil and gas drilling continues for 24 hours a day until the well is completed. During this time, most wildlife including waterfowl and many songbirds are expected to avoid the immediate area. However, once drilling is completed, reserve pits with water (which can become soiled by drilling fluids) can become a hazard for waterfowl and other birds. If the well is put into production, there is documentation of birds and bats using open vent stacks for roosting or perching. Once in these stacks, animals can become trapped or asphyxiated. While much of the work documenting this problem has occurred in western States, the situation in Alabama is expected to be similar.

Roads and other construction projects across the State can alter the local hydrography reducing surface flow to mesic areas and diverting or degrading surface water supporting wetland habitats. Installation of culverts and diverting existing drainages help to maintain existing hydrologic systems, but the disturbance causes local sedimentation and can retard sheet flow to wetland habitats. Amphibians and many reptiles associated with wetland communities are vulnerable to disturbance, as they are not highly mobile and tend to have narrow habitat requirements.

Impacts would also include the direct loss of habitat from the general construction projects, including private development and transportation projects, from degradation of nearby aquatic or wetland habitats through sedimentation or changes in hydrology.

Although significant habitat degradation and loss would likely occur as a result of the reasonably foreseeable actions identified for this analysis, BLM activities would have a minimal contribution to these effects on wildlife due to management protection provided under all alternatives, with Alternatives 2, 3, and 4 providing more stringent protection than Alternative 1. In the long term, depending on the location and intensity of construction and minerals development, it is likely that public lands containing viable habitats for wildlife would continue to be utilized by these species.

Special Status Species

Given the high number and dispersed distribution of special status species in aquatic and wetland habitats in Alabama, the continuation of mineral development (totaling approximately 4,000 wells with 20,811 acres of surface disturbance) and soil disturbance and vegetation loss from other construction projects across the State (approximately 78,600 acres of surface disturbance annually) near rivers, creeks, or wetland habitats has a high potential of affecting special status species in the immediate area or downstream of the disturbance.

Impacts to aquatic and wetland habitats would occur through degradation of water quality through increased sedimentation or turbidity, contamination, direct loss of habitat, and changes in local hydrography. Sedimentation and increased turbidity is listed as a current threat to most of Alabama’s mussels and special status fish species. The potential for sedimentation increases with prolonged or heavy rains that are typical in this area. Cut and fill slopes associated with other construction projects across the State are particularly vulnerable before protective plant covers have been established. Intact vegetation along riparian zones and around wetlands could substantially buffer these areas. Sediments deposited in intermittent drainages and headwater streams would be transported downstream during periods of high water, increasing turbidity and burying aquatic invertebrates in higher order streams.

Filling wetlands, including bogs, seepage slopes, wet flatwoods, and forested swamps for construction and maintenance of well pads for oil and gas development and/or other construction projects across the State generally alters the site sufficiently to preclude the reestablishment of these communities in the foreseeable future, and could result in direct habitat loss for a wide variety of special status species which use these habitats. Because so many of these species have limited ranges, the list of species potentially affected varies by location. Generally, because of the limited acreage of these vegetation communities, loss from even the small amount of disturbance has the potential of destroying or degrading habitat for special status species. Construction and maintenance activities and other construction projects across the State could disrupt the local hydrography supporting seepage slopes or sheet flow to bogs and swamps degrading these habitats.

Karst formations support cave habitats with high numbers of special status species, including many endemic crayfish, salamanders, and bats and are particularly sensitive to oil and gas development. In caves, even minor alterations in temperature, humidity, and water quality or water quantity could result in irreversible impacts. Caves by their nature are isolated and support highly endemic faunas often with extremely narrow habitat requirements. Wells drilled through cave/karst resources could result in contaminants, such as drilling fluids and cements, draining into the cave/karst system. Karst habitats could be degraded by hydrocarbons from spills or leaks from well casings, storage tanks, reserve pits, pipelines, and production facilities that may enter into the cave/karst systems. Additionally, cementing operations could affect portions of underground drainage systems by restricting groundwater flow and introducing pollutants into karst systems. Other possible impacts are vented or escaped gases collecting in sinkholes and caves. These gases could cause a die-off of plant and animal life that use the special habitat created by the microclimate of the cave entrances or sinkhole.

Although significant habitat degradation and loss would likely occur as a result of the reasonably foreseeable actions identified for this analysis, BLM activities would have a minimal contribution to these effects on special status species due to the minimal numbers of oil and gas development anticipated (20 wells) and management protection provided for these species under all alternatives, with Alternatives 2, 3, and 4 providing more stringent protection than Alternative 1. BLM would also be required to consult with USFWS to identify and establish specific conservation actions that could be taken to mitigate the potential effects of land management activities.

Wildland Fire Ecology and Management

In addition to the ignition sources associated with development of 20 new oil and gas wells noted in the impact analysis, there are over 8,000 existing oil and gas wells throughout Alabama. An additional 4,000 oil and gas wells would be developed on non-Federal and USFS FMO over the next 20 years. Cumulatively, the potential increases in wildland fires from the addition of 20 wells compared to 12,000 existing and potential wells would not significantly increase the risk of fire in Alabama. Likewise, the infrastructure associated with oil and gas or ROW developments would no significantly improve access or provide fuels breaks compared to the cumulative developments and current rate of 78,600 acres of land developed annually (1997-2003) in Alabama.

The cumulative effect of proposed vegetation treatments on the 159 acres of surface tracts would be in addition to 86,154 acres of vegetation treatments by other Federal agencies, as well as prescribed burns performed by State and local agencies and private or corporate forestry operations. The proposed treatments would help maintain or restore small areas to their natural regimes, as well as improve the ability to protect WUI areas from wildfire. Cumulatively, the implementation of all these treatments would reduce the cost of suppressing wildfires.

Cultural Resources

While cultural resources on USFS FMO and non-USFS FMO enjoy legal protection, similar protection from surface disturbing activities does not apply to cultural resources from private actions on private lands. Oil and gas development in areas with private surface and FMO still require compliance with cultural resource laws. However, oil and gas development in areas of private surface and private mineral ownership, or non-mineral developments in areas with private surface FMO, could result in cumulative impacts to cultural resources throughout Alabama. This could result in unmitigated damage and loss of cultural sites and artifacts in areas of private surface and mineral ownership where oil and gas wells are developed. Cumulatively, Alternative 2 provides the greatest level of protection from cumulative impacts due to the largest number of closed and NSO acres. Alternatives 3 and 4 provide the next greatest level of protection. In these areas, the potential for inadvertent damage and loss of cultural resources is the lowest.

An additional 105 acres associated with development of 20 wells on non-USFS FMO and 20,811 acres associated with development of an estimated 4,000 additional wells on non-Federal mineral estate and USFS FMO would be added to the existing disturbance from development of over 8,000 oil and gas wells in Alabama over the past twenty years. Acreage developed on USFS FMO would receive protections from Federal law, regulation, and policy. Developments in those areas would be required to comply with NHPA and Archaeological Resources Protection Act (ARPA) in inventorying areas and determining eligibility of sites for the NRHP. Additional developments on USFS FMO would result in the identification of more cultural sites during inventories. Excavation of sites as part of mitigating impacts from development on USFS FMO would enable scientific retrieval and study of cultural resources, using today’s technology and methodology. While data recovery preserves as much data as possible, the excavated portions of the property would be lost or damaged. Removing cultural resources from a site using current scientific methods also reduces future scientific value if more accurate methods of analysis are developed.

Combined with disturbance from mineral development, other Federal agencies perform over 86,000 acres of vegetation treatments throughout Alabama annually. Approximately 92 percent of the treated acres (79,219 acres) would be treated by prescribed fire. Additional acreages would be treated by State and local agencies and private individuals. Treatments by Federal agencies would require cultural inventories prior to implementation, identifying and protecting cultural sites. However, treatments by State and local agencies and private individuals could impact cultural resources through burning and suppression efforts. Cumulatively, the alternatives would have little effect on these impacts as the levels of treatment and BLM surface acreage are very small in comparison, although Alternatives 3 and 4 would have the greatest cumulative effect as it proposes the greatest levels of vegetation treatment to support other resources.

Development of BLM surface tracts would not be permitted until disposal, which would only occur under Alternatives 3 and 4. Protection measures in Alternative 3 would protect cultural resource sites from damage or loss. However, under Alternative 4 it is assumed that the Coosa River, Fort Morgan Beach, Fort Morgan Highway, Fowl River, and Jordan Lake tracts would all be developed. All the tracts except the Coosa River tracts have been inventoried, so potential impacts would be limited to those 42 acres. Following disposal, developments on these tracts would no longer require cultural inventories or mitigation, which could result in the damage or loss of cultural sites. Cumulatively, this would be in addition to an approximate 78,600 acres of development per year on private land, which could similarly impact cultural sites.

The number of sites anticipated to be cumulatively damaged resulting from actions proposed in this RMP combined with other cumulative projects and activities is unknown because most areas have not been surveyed for cultural resources.

Visual Resources

Cumulative impacts on visual resources would occur primarily from activities that affect the visual quality of the area. Such impacts would result from mineral development activities, ROW development, increased recreational activity, and actions associated with management of vegetative communities and fish and wildlife habitat. Surface disturbing activities associated with mineral development and ROWs would create visual intrusions that could alter the landscape setting and degrade visual quality. The possible ROW development and disturbance of a maximum of 105 acres from oil and gas development across the State of Alabama comprises less than one percent of the 20,811 acres of surface disturbance anticipated from oil and gas development on non-Federal and USFS lands. Although more than 8,000 wells have been completed in Alabama since 1983, the minimal number of 20 additional wells identified in the RFDS would not significantly diminish visual quality. Closing or limiting areas to motorized recreation uses and implementing restrictions designed to protect sensitive resources would help to maintain the visual quality in restricted areas. Efforts to maintain and improve vegetative communities and fish and wildlife habitat would indirectly enhance visual quality through improvement of the visual landscape.

Cumulative impacts would be similar among the four alternatives, as the same level of development is expected under all alternatives. However, Alternatives 2, 3, and 4 provide for specific actions to improve vegetative communities and fish and wildlife habitat, thereby enhancing visual quality. In addition, implementing an NSO stipulation within 1,000 feet of aquatic habitats under Alternative 2 would preserve the visual quality within these areas. Impacts would likely be greatest under Alternative 4, as development of the tract is expected to occur subsequent to disposal, which would add to the visual intrusions of development on adjacent lands for some tracts, such as the Fort Morgan tracts.

Minerals

In Alabama, no cumulative impacts would be anticipated to minerals exploration and development as a result of BLM-administered surface tract and non-USFS FMO land use allocations and management actions since the RMP would not restrict or preclude mineral development and exploration. An irretrievable commitment of oil and gas and coal would result from mineral extraction via 20 wells developed over the next 20 years in Alabama and continued leasing of 1.9 tons of coal per year over the next 20 years (37.6 million tons of Federal coal) on non-USFS FMO in the Warrior Basin. These impacts would be the same for all alternatives.

Recreation and Travel Management

Most of Alabama is not managed by the Federal government, and recreation and travel opportunities are often dependant on whether the private landowner allows access or travel access the private surface. Therefore, maintaining Federal ownership of public lands under Alternatives 1 and 2 would maintain limited opportunities for public recreation and travel. Under Alternatives 3 and 4, opportunities for travel and recreation could be precluded after disposal, cumulatively adding to the current restrictions on private lands throughout the State. Although BLM management actions and disposal actions under the alternatives could have localized impacts to recreation experience and travel opportunities, no significant cumulative impacts would be anticipated because of the small size and scattered nature of BLM-administered surface tracts. Much of the access to the scattered BLM tracts is controlled by other surface owners. Cumulative projects and activities (continued mineral development and other construction projects) could lead to more travel opportunities associated with increased route construction to support mineral development, but there would also be a reduction in primitive/non-motorized recreation opportunities. Minerals development on non-USFS FMO lands open to recreation and leasing could result in unavoidable adverse impacts to recreation through detracting from the recreational setting. Mineral exploration and development activities would have short term effects on the quality of the setting because of drilling equipment and long term impacts from road construction and vegetation removal.

Development assumed to occur on disposed tracts under Alternative 4 could change the recreation opportunities from dispersed in nature to more developed on the Coosa River, Jordan Lake, Fort Morgan Beach and Highway and Fowl River tracts. In these areas, recreational developments would reduce opportunities for dispersed recreation, as well as reducing travel in these areas of private development. Under Alternative 3, this impact would be limited to the Jordan Lake tract.

Lands and Realty

Increasing development leads to a greater demand for lands and realty actions, creating the need for additional ROWs for roads, pipelines and powerlines. Restrictions on ROWs under Alternatives 2, 3, and 4 would have a negligible cumulative effect by reducing routing options and possibly increasing construction costs for ROW development since there is only 159 acres of BLM administered lands scattered across the State. Increasing development also leads to a greater demand for additional available land.

Social and Economic

BLM-administered minerals comprise a very small proportion of oil and gas development in Alabama. Twenty new oil and gas wells in Alabama constitute less than one percent, 0.5 percent, of the 4,000 anticipated oil and gas wells on USFS and non-Federal agencies lands. Historically, BLM has permitted 17 wells on BLM-administered FMO in Alabama, representing 0.2 percent of the 8,068 total wells permitted over the past 20 years. In Alabama, with the anticipated well projections, BLM FMO would represent slightly more of the total wells, compared to the previous 20 years; however, the BLM-administered FMO wells are half of one percent and still relatively a very small percentage.

Overall, the rate of oil and gas development in Alabama is expected to decrease, from 8,068 wells (average of 403 wells per year) to 4,000 anticipated over the next 20 years (average of 200 wells per year). This is a decrease in oil and gas development by 50 percent (from the last 20 years to the next 20 years).

Many of the cumulative socioeconomic impacts associated with oil and gas development are already occurring in the region and would be perpetuated in the future. For instance, oil and gas activity is generating employment opportunities and labor earnings for communities that support these types of activities. However, the employment and income from BLM-administered oil and gas is likely very low since it represents such a small proportion of the total development and production in Alabama. Overall, however, with slight decreases in oil and gas development expected to occur across the State, there would be decreases in tax revenue to local, State and federal government entities. With the decreases in overall oil and gas development in the State, socioeconomic characteristics and trends, such as infrastructure and community services, may be slightly decreasing as a result of decreasing fiscal revenues that often support these types of services within the State.

In general, the pace and timing of mineral development activities is dependent on a variety of factors beyond the management decisions of BLM. This includes national and international energy demand and prices, production factors within the planning area and business strategies of operators. Because the pace of development in the planning area is only an estimate, actual cumulative impacts may vary if the oil and gas activity across the State changes over the planning period.

Coal development is expected to only occur on the Alabama BLM-administered minerals, with potential development of 1.9 million tons of coal produced per year, in essence an extension of the BLM coal production rates which have occurred in the past 10 years. The existing two leases are expected to be mined out, while new development could occur on four additional leases. In 1999, the 1.9 million tons of coal produced from BLM-administered minerals represented 9.7 percent of the coal produced in Alabama of 19.5 million tons (Energy Information Agency). Between 1990 and 1999, coal production in the State decreased by an average annual rate of 4.3 percent. If this decreasing production continues in the future, coal production from BLM-administered minerals would likely represent a larger portion of the total coal produced from the State. Coal production supports employment and employee compensation in the State (677 employees and $48 million in employee compensation); with decreasing production across Alabama, it is likely that overall, employment and earnings are also decreasing in the coal mining industry and in industries that support coal mining. This also suggests that royalty revenues from BLM-administered coal mining may be increasing as a proportion of total coal mining, which could influence the relocation of industries that support coal development closer to these BLM-administered minerals. There are likely some slight fiscal revenue declines since the production levels are decreasing across the State, which could also have impacts for infrastructure, social services, school funding, and other related government services.

A number of the alternatives in this Draft RMP-EIS consider Federal disposal of various tracts of surface lands. Under Alternative 4, there are three tracts (Fort Morgan Beach, Fort Morgan Highway, and Fowl River) available for recreational or residential development in Alabama comprising 117 acres, while one additional tract (Jordan Lake) could be developed as recreational camps (4 acres). In total, 121 acres could potentially be developed for recreational or residential use in Alabama. The State of Alabama comprises 33.5 million acres of surface land, of which BLM manages 159 acres (less than one percent) and the USFS manages 667,000 acres (2 percent). The disposal of these 159 acres and subsequent development of 117 acres of surface lands is not likely to have cumulative socioeconomic impacts as the disposal acres represent such a small portion of BLM lands, Federal lands, and private lands within the State. For the socioeconomic impacts of the individual alternatives, please see section 4.2.

Environmental Justice

There were no Environmental Justice populations identified within the four-county area where mineral development is anticipated in Alabama. Therefore, there would be no anticipated cumulative impacts on these populations. Since the additional expected oil and gas activity locations for the BLM-administered FMO have not been specified, impacts to these to these populations should be considered at the time of implementation.

Hazardous Materials

BLM-authorized activities on surface tracts and non-USFS FMO could include use of hazardous materials, substances, and waste (including storage, transportation, and spills). Such activities include oil and gas development, coal development, and application of pesticides to improve vegetative communities and wildlife habitat. These activities are conducted in compliance with 29 CFR 1910, 49 CFR 100-185, 40 CFR 100-400, CERCLA, RCRA, SARA, TSCA, and the CWA and other Federal and State regulations and policies regarding hazardous materials management. Therefore, if any releases were to occur, it would be immediately addressed and remediated in accordance with regulation and cumulative impacts are not anticipated. Contribution of hazardous materials, substances, and waste could occur from other sources on adjacent lands that could lead to cumulative impacts on BLM lands.

4.4.2 Cumulative Impacts from BLM Management Actions in Mississippi

Air Quality

The cumulative impacts of air quality are evaluated by comparing the BLM site emissions with regionwide emissions. For the State of Mississippi, comprehensive emissions are only available for NO_X, CO, and VOCs. These emissions can be obtained from the Mississippi Department of Environmental Quality (MDEQ). Using the best available data from MDEQ, Table 4-11 shows a comparison between the Statewide sources and the BLM induced emissions. Based on this data, emissions from activities associated with potential oil and gas development and minerals mining on BLM-administered non-USFS FMO tracts proposed in this RMP would not considerably contribute to cumulative air quality emissions within the region (presented in Table 4-11). Over the next 20 years, emissions from 10 wells would comprise less than 1 percent of the emissions associated with the estimated 12,000 wells that could be developed on non-Federal and USFS lands in Alabama. These impacts would be the same for all alternatives.

Table 4-11. Comparison of Potential BLM Emissions with Cumulative Emissions for Mississippi (tons per year) [1, 2]

Well and Mine Locations	Emission Type/Pollutant		
	NO_x	CO	VOC
BLM-Administered FMO Estate in Mississippi	89	141	23
Other Mineral Estate Across Mississippi	295,456	1,301,914	272,897

1. Compared to best available 2002 data from the Mississippi Department of Environmental Quality (MDEQ, 2005).
2. Combination of oil and gas and coal mining.

Soil Resources

In Mississippi, the disturbance of a maximum of 55 acres from oil and gas development across the State of Mississippi comprises less than one percent of the 59,745 acres of surface disturbance anticipated from oil and gas development on non-Federal and USFS lands over the next 20 years. Although more than 7,000 wells have been completed in Mississippi since 1983, the minimal number of 10 additional wells identified in the RFDS would have no long-term impacts to soil productivity and therefore would not contribute to significant cumulative effects. These impacts would be the same for all alternatives.

Possible soil impacts associated with vegetative communities, fish and wildlife habitat, and lands and realty management actions including ROW development and potential development after disposal on the 174-acre Hancock County tract comprises less than one percent of the 33,717 acres disturbed annually (1997-2003) from other construction projects across the State including private development and transportation projects (as estimated by the NRI data). There would be more potential for soil disturbance impacts associated with vegetative communities and fish and wildlife habitat management actions proposed under Alternatives 2 and 3 as opposed to Alternatives 1 and 4 that do not propose any actions beyond standard management common to all alternatives. There would be more potential for soil disturbance impacts associated with ROW management actions under Alternative 1, which allows ROW development on the Hancock County tract, than Alternatives 2, 3, and 4, which designates the tract as a ROW avoidance area. The potential for soil disturbance impacts associated with lands and realty disposal actions would be the same under all alternatives, since the Hancock Country tract would continue to be used for recreation and research site purposes with no expected development.

Water Resources

The emergent wetlands that comprise the Hancock County tract would change as a result of mineral exploration and development or construction activities. However, BMPs and stipulations identified in Appendix D would minimize irreversible and irretrievable commitment of resources and unavoidable adverse impacts. Also, the disturbance of a maximum of 55 acres from oil and gas development across the State of Mississippi comprises less than one percent of the 59,745 acres of surface disturbance anticipated from oil and gas development on non-Federal and USFS lands. Although more than 7,000 wells have been completed in Mississippi since 1983, the minimal additional 10 wells identified in RFDS would have no long-term impacts to water resources and, therefore, would not contribute to cumulative effects. These impacts would be the same for all alternatives.

Vegetative Communities

The continuation of mineral development (totaling approximately 12,000 wells with 59,745 acres of surface disturbance) and soil disturbance and vegetation loss from other construction projects across the State (approximately 33,717 acres of surface disturbance annually) has a high potential of affecting plant communities, such as glades and prairies, that are sensitive to disruption and difficult to restore after surface disturbing activities. These activities also have the potential to introduce and promote the spread of invasive, exotic plant species.

Throughout the State, some plant communities, embedded in the larger forested landscape, are particularly sensitive to disruption and are difficult to restore after surface disturbing activities. Many of these are restricted to a narrow range of soil types such as glades and prairies; others are sensitive to changes in hydrography, such as bogs, forested wetlands, and seepage slope communities. Construction activities in these plant communities generally alter the site sufficiently to preclude the reestablishment of these communities in the foreseeable future. Also, because of the limited acreage of these vegetation communities, loss of even small acreages has a disproportionate effect on the plant diversity in an area.

Surface disturbing activities have the potential to introduce or promote the spread of invasive, exotic plant species. Impacts are dependent on the species planted during restoration activities and the management of the site during and following restoration. Restoration activities typically include seeding non-native grasses, such as annual rye (during the winter months) and Bahia or Bermuda grass (during the summer months) to provide a quick cover for disturbed soils. Including native species in the mix increases diversity and provides a more natural structure. If these areas are mowed following abandonment, these non-native grasses are expected to persist and dominate the site. If, however, the sites are replanted in pine, or left unmowed the areas can be expected to progress through old field type growth which is dominated by opportunistic native and non-native species alike. Ultimately, both Bahia and Bermuda grass are expected to become shaded out as a tree or heavy shrub layer becomes established. Japanese honeysuckle and Chinese privet can both persist in shaded situations.

Although effects to vegetative communities from surface disturbing activities and the introduction of invasive, exotic plant species would likely occur as a result of the reasonably foreseeable actions identified for this analysis, BLM activities would have a minimal contribution to these effects on plant communities due to the small amount of acreage that would be disturbed under BLM management alternatives and BLM policies on BMPs for mineral development reclamation and control of noxious, exotic species.

Fish and Wildlife

The continuation of mineral development (totaling approximately 12,000 wells with 59,745 acres of surface disturbance) and soil disturbance and vegetation loss from other construction projects across the State (approximately 33,717 acres of surface disturbance annually) has a high potential of affecting fish and wildlife and associated habitat through displacement, habitat degradation, and direct habitat loss.

Impacts to many wildlife species from oil and gas development are localized and temporary. Most common game species and other mobile wildlife species avoid the well pad areas during construction and maintenance. Less mobile species are directly impacted and during the spring and early summer; this can include nesting neotropical birds. Habitat generalists, including most game species, tend to return to surrounding habitats after the well is completed and construction and maintenance activities have ceased. Intermittent maintenance and inspection activities conducted on the established pad for the life of the well are not expected to alter the overall use of the area by wildlife. However, construction in high value habitats or in areas with more narrowly adapted wildlife species can alter the overall species diversity. Wells and roads in areas of contiguous forests increase habitat fragmentation, reducing the suitability of the area for interior nesting birds and making nests more susceptible to predation and parasitism. Older growth forests which provide habitat for interior forest nesting birds and a wider diversity of amphibians and reptiles are often located in riparian zones left as buffers during logging operations or in steeper, less accessible slopes.

Oil and gas drilling continues for 24 hours a day until the well is completed. During this time, most wildlife, including waterfowl and many song-birds, are expected to avoid the immediate area. However, once drilling is completed, reserve pits with water (which can become soiled by drilling fluids) can become a hazard for waterfowl and other birds. If the well is put into production, there is documentation of birds and bats using open vent stacks for roosting or perching. Once in these stacks animals can become trapped or asphyxiated. While much of the work documenting this problem has occurred in western states, the situation in Mississippi is expected to be similar.

Roads and other construction projects across the State can alter the local hydrography reducing surface flow to mesic areas and diverting or degrading surface water supporting wetland habitats. Installation of culverts and diverting existing drainages help to maintain existing hydrologic systems, but the disturbance causes local sedimentation and can retard sheet flow to wetland habitats. Amphibians and many reptiles associated with wetland communities are vulnerable to disturbance, as they are not highly mobile and tend to have narrow habitat requirements.

Impacts would also include the direct loss of habitat from the general construction projects, including private development and transportation projects, from degradation of nearby aquatic or wetland habitats through sedimentation or changes in hydrology.

Although significant habitat degradation and loss would likely occur as a result of the reasonably foreseeable actions identified for this analysis, BLM activities would have a minimal contribution to these effects on wildlife due to management protection provided under all alternatives, with Alternatives 2, 3, and 4 providing more stringent protection than Alternative 1. In the long term, depending on the location and intensity of construction and minerals development, it is likely that public lands containing viable habitats for wildlife would continue to be utilized by these species.

Special Status Species

The continuation of mineral development (totaling approximately 12,000 wells with 59,745 acres of surface disturbance) and soil disturbance and vegetation loss from other construction projects across the

State (approximately 33,717 acres of surface disturbance annually) has a high potential of affecting special status species through habitat loss or degradation and species displacement.

The Federally-listed species most likely to be affected are gopher tortoise, red-cockaded woodpecker, and black pine snake in the East Gulf Coastal Plain, and bald eagles associated with reservoirs and rivers in the northern portion of the State. There is some potential to affect the small acreages supporting special status species anywhere in the State and a potential statewide to affect Federal- and State-listed aquatic species.

Gopher tortoise could be impacted by surface disturbing activities, including mineral exploration and development and other construction projects across the State, in upland areas of the East Gulf Coastal Plain where forest practices on private lands have maintained at least marginally suitable habitat. Foraging habitat for tortoise could also be affected on non-USFS FMO associated with private inholdings in the Chickasawhay, DeSoto and Homochitto National Forests, which support substantial tortoise populations. During general construction projects across the State, including private development and transportation projects, and construction of wells pads, access roads, and production facilities, gopher tortoises could be impacted by the loss or damage to burrows, destruction of foraging habitat, or killed during construction or by service vehicles. Construction activities and roads within 600-feet of burrows could isolate individuals and reduce reproductive potential within a population. In many cases, the presence of gopher tortoises indicates that habitat is suitable for a host of species associated with dry longleaf pine forests, many of them special status species, such as the black pine snake (*Pituophis melanoleucus lodingi*), which could also be impacted by activities.

Red-cockaded woodpecker could be affected by oil and gas development and other general construction projects across the State, including private development and transportation projects, through the loss of nesting habitat within existing clusters, and through the loss of current or potential foraging habitat within 0.5 miles of existing clusters. Non-USFS FMO in areas supporting red-cockaded woodpecker is generally privately owned and often managed for commercial timber production. Harvest rotations on these properties are typically too short to sustain suitable nesting habitat for red-cockaded woodpeckers, however there is potential to impact suitable foraging habitat, particularly on non-USFS FMO near the Chickasawhay, DeSoto, Homochitto National Forests, or Noxubee NWR, areas that support most of the State's population.

Throughout the State, breeding and wintering bald eagles could be affected by drilling and other general construction projects across the State, including private development and transportation projects, near large rivers or reservoirs. Bald eagles are particularly sensitive during courting, nesting, and fledging young; in Alabama this typically occurs between December 1 and August 1. Construction activities within 1.5 miles of nest sites could result in nest abandonment depending on factors such as visibility and tolerance of individual pairs.

Throughout the State, oil and gas development and other general construction projects, including private development and transportation projects, has the potential to impact aquatic and wetland habitats. These could result in degradation of water quality through contamination and increased sedimentation, direct loss of habitat, and changes in the local hydrography supporting these systems. Increases in sedimentation to streams and wetlands by oil and gas development are a factor of well pad design, slope, erodibility of the soils, proximity of the disturbance, and the intervening vegetation. The potential for sedimentation increases with prolonged or heavy rains that are typical in this area. Cut and fill slopes associated with other construction projects across the State are particularly vulnerable before protective plant covers have been established. While intact vegetation along riparian zones and around wetlands could substantially buffer these areas, the steepness of the intervening slopes, particularly over 25 percent can reduce the effectiveness of buffers. Research has shown that a minimum of a 30-foot buffer of vegetation is needed to control sediments. However, construction activities within 100-feet can reduce stream invertebrates, and 1,000-feet or more may be needed to protect some amphibians, reptiles and forest interior birds (Wenger 1999). Sediments deposited in intermittent drainages during construction can be transported downstream during periods of high water, increasing turbidity and burying aquatic invertebrates in higher order streams and potentially affecting special status species substantial distances from the construction site, including Louisiana quillwort (*Isoetes louisianensis*), listed as Federally endangered.

Filling wetlands, including bogs, seepage slopes, wet flatwoods, and forested swamps for construction and maintenance of well pads for oil and gas development and/or other construction projects across the State generally alters the site sufficiently to preclude the reestablishment of these communities in the foreseeable future, and could result in direct habitat loss for a wide variety of special status species. Because of the limited acreage of these vegetation communities, loss of even the small acreages has a high potential of destroying or degrading habitat for special status species. Many of these species have limited ranges so the list of species potentially affected varies by location. For example, the Mississippi CWCS notes 14 special status species are associated with pines seeps and pitcher plant bogs, including eight special status crayfish, five of which are endemic. Henslow's sparrow wintering habitat and breeding habitat for Bachman's sparrow could be lost by construction in or near grassy bogs or wet flatwoods. Construction and maintenance activities and other construction projects across the State could disrupt the local hydrography supporting seepage slopes or sheetflow to bogs and swamps degrading these habitats.

There are estimated to be 65 caves in Mississippi located in the northeast corner and east central portions of the State. Caves by their nature are isolated and support highly endemic faunas often with extremely narrow habitat requirements. In Mississippi, this includes two State-listed salamanders and a number of bat species. Although the potential to affect these areas is low, caves are particularly sensitive to oil and gas development. Even minor alterations in temperature, humidity and water quality or water quantity could result in irreversible impacts. Drilling through cave/karst resources could result in contaminants, such as drilling fluids and cements, draining into the cave/karst system. Karst habitats could be degraded by hydrocarbons from spills or leaks from well casings, storage tanks, reserve pits, pipelines, and production facilities that may enter into the cave/karst systems. Additionally, cementing operations could affect portions of underground drainage systems by restricting groundwater flow and introducing pollutants into karst systems.

Construction in coastal areas could affect the 18 special status species that are associated with coastal marshes and maritime scrub and woodlands, including brown pelican, Wilson's plover, Mississippi diamondback terrapin, and saltmarsh topminnow. Impacts would occur from direct habitat loss, destruction of foraging and nesting habitat, and habitat abandonment.

Although significant habitat degradation and loss would likely occur as a result of the reasonably foreseeable actions identified for this analysis, BLM activities would have a minimal contribution to these effects on special status species due to the minimal numbers of oil and gas development anticipated (10 wells) and management protection provided for these species under all alternatives, with Alternatives 2, 3, and 4 providing more stringent protection than Alternative 1. BLM would also be required to consult with USFWS to identify and establish specific conservation actions that can be taken to mitigate the potential effects of land management activities.

Wildland Fire Ecology and Management

In addition to the ignition sources associated with development of 10 new oil and gas wells noted in the impact analysis, there are over 7,362 existing oil and gas wells throughout Mississippi. An additional 12,000 oil and gas wells would be developed on non-Federal and USFS FMO over the next 20 years.

Cumulatively, the potential increases in wildland fires from the addition of 10 wells compared to 19,362 existing and potential wells would not significantly increase the risk of fire in Mississippi. Likewise, the infrastructure associated with oil and gas or ROW developments would not significantly improve access or provide fuels breaks compared to the cumulative developments and current (1997-2003) rate of 33,717 acres of land developed annually in Mississippi.

The cumulative effect of proposed vegetation treatments on the 174 acres of the Hancock County surface tract would be in addition to 264,981 acres of vegetation treatments by other Federal agencies, as well as prescribed burns performed by State and local agencies and private or corporate forestry operations. The proposed treatments would help maintain or restore small areas to their natural regimes, as well as improve the ability to protect WUI areas from wildfire. Cumulatively, the implementation of all these treatments would reduce the cost of suppressing wildfires.

Cultural Resources

As noted in the Alabama cumulative impacts, cultural resources on private surface do not enjoy the same legal protections as sites on USFS FMO and non-USFS FMO. As such, oil and gas development in areas of private surface and private mineral ownership, or non-mineral developments in areas with private surface and FMO, could result in cumulative impacts to cultural resources throughout Mississippi. This could result in unmitigated damage and loss of cultural sites and artifacts in areas of private surface and mineral ownership where oil and gas wells are developed. Cumulatively, Alternative 2 provides the greatest level of protection from cumulative impacts due to the largest number of closed and NSO acres. Alternatives 3 and 4 provide the next greatest level of protection. In these areas, the potential for inadvertent damage and loss of cultural resources is the lowest.

An additional 55 acres associated with development of 10 wells on non-USFS FMO and 59,745 acres associated with development of an estimated 12,000 additional wells on non-Federal mineral estate and USFS FMO would be added to the existing disturbance from development of over 7,000 oil and gas wells in Alabama over the past twenty years. Acreage developed on USFS FMO would receive protections from Federal law, regulation, and policy. Developments in those areas would be required to comply with NHPA and ARPA in inventorying areas and determining eligibility of sites for the NRHP. Additional developments on USFS FMO would result in the identification of more cultural sites during inventories. Excavation of sites as part of mitigating impacts from development on USFS FMO would enable scientific retrieval and study of cultural resources, using today’s technology and methodology. While data recovery preserves as much data as possible, the excavated portions of the property would be lost or damaged. Removing cultural resources from a site using current scientific methods also reduces future scientific value if more accurate methods of analysis are developed.

Combined with disturbance from mineral development, other Federal agencies perform approximately 227,720 acres of vegetation treatments throughout Mississippi annually. Approximately 86 percent of the treated acres (227,720 acres) would be treated by prescribed fire. Additional acreages would be treated by State and local agencies and private individuals. Treatments by Federal agencies would require cultural inventories prior to implementation, identifying and protecting cultural sites. However, treatments by State and local agencies and private individuals could impact cultural resources through burning and suppression efforts. Cumulatively, the alternatives would have little effect on these impacts as the levels of treatment and BLM surface acreage are very small in comparison, although Alternatives 2 and 3 would have the greatest cumulative effect as it proposes the greatest levels of vegetation treatment to support other resources.

Development throughout Mississippi disturbs approximately 33,717 acres annually. Disposal and development of the BLM surface tract in Hancock County would only be permitted in Alternative 4, although it would have to be managed in a manner to protect Federally listed species and associated wetland/aquatic habitat. The potential to disturb, damage or lose cultural resources would be low in these instances, but there would be no protections specifically for cultural resources if transferred from Federal ownership. Cumulatively, however, management of a disposed Hancock County tract would not result in significant additions to the annual disturbances throughout Mississippi. Alternatives 1, 2, and 3 would protect any cultural sites in the Hancock County tract.

The number of sites anticipated to be cumulatively damaged resulting from actions proposed in this RMP combined with other cumulative projects and activities is unknown because most areas have not been surveyed for cultural resources.

Visual Resources

Cumulative impacts on visual resources would occur primarily from activities that affect the visual quality of the area. Such impacts would result from mineral development activities, ROW development, increased recreational activity, and actions associated with management of vegetative communities and fish and wildlife habitat. Surface disturbing activities associated with mineral and ROW development would create visual intrusions that could alter the landscape setting and degrade visual quality. The disturbance of a maximum of 55 acres across 517,934 acres of Mississippi FMO and possible ROW development as a result of management actions would not contribute to significant cumulative impacts. Although more than 7,000 wells have been completed in Mississippi since 1983, the minimal number of 10 additional wells identified in the RFDS would not significantly diminish visual quality. Closing or limiting areas to motorized recreation uses and implementing restrictions designed to protect sensitive resources would help to maintain the visual quality in restricted areas. Efforts to maintain and improve vegetative communities and fish and wildlife habitat would indirectly enhance visual quality through improvement of the visual landscape.

Cumulative impacts would be similar among the four alternatives, as the same level of development is expected under any of the alternatives. However, Alternatives 2 and 3 provide for specific actions to improve vegetative communities and fish and wildlife habitat, thereby enhancing visual quality. In addition, implementing an NSO stipulation within 1,000 feet of aquatic habitats under Alternative 2 would preserve the visual quality within these areas. No visual impacts are anticipated under all alternatives from lands and realty disposal actions since the Hancock Country tract would continue to be used for recreation and research site purposes with no expected development. Given the remote marsh nature of the tract, any development on adjacent lands would be minimal and the disposal would not cumulatively contribute to land development in the area.

Minerals

In Mississippi, no cumulative impacts would be anticipated to minerals exploration and development as a result of BLM-administered surface tract and non-USFS FMO land use allocations and management actions since the RMP would not restrict or preclude mineral development and exploration. In addition, an irretrievable commitment of oil and gas would occur from mineral extraction from 10 wells developed over the next 20 years in Mississippi. These impacts would be the same for all alternatives.

Recreation and Travel Management

Most of Mississippi is not managed by the Federal government, and recreation and travel opportunities are often dependant on whether the private landowner allows access or travel access the private surface. Therefore, maintaining Federal ownership of public lands under Alternatives 1, 2 and 3 would maintain limited opportunities for public recreation and travel. Under Alternative 4, opportunities for travel and recreation could be precluded after disposal, cumulatively adding to the current restrictions on private lands throughout the State. Although BLM management actions and disposal actions under the alternatives could have localized impacts to recreation experience and travel opportunities, no significant cumulative impacts would be anticipated because of the small size of the BLM-administered surface tract. Cumulative projects and activities (continued mineral development and other construction projects) could lead to more travel opportunities associated with increased route construction to support mineral development, but there would also be a reduction in primitive/non-motorized recreation opportunities. Minerals development on non-USFS FMO lands open to recreation and leasing would result in unavoidable adverse impacts to recreation through detracting from the recreational setting. Mineral exploration and development activities could have short term effects on the quality of the setting because of drilling equipment and long term impacts from road construction and vegetation removal.

Lands and Realty

Increasing development leads to a greater demand for lands and realty actions, creating the need for additional ROWs for roads, pipelines and powerlines. Restrictions on ROWs under Alternatives 2, 3, and 4 would have a negligible cumulative effect by reducing routing options and possibly increasing construction costs for ROW development since there is only 174 acres of BLM administered lands scattered across the State. Increasing development also leads to a greater demand for additional available land.

Social and Economic

The greatest potential for cumulative socioeconomic impacts is associated with increasing oil and gas development throughout Mississippi. The following information indicates that overall Mississippi is expected to experience an increase in oil and gas development of 63 percent (between the last 20 years and the next 20 years). Overall, there were 7,362 wells permitted over the past 20 years (average of 368 wells per year) to an anticipated 12,000 total wells over the next 20 years (average of 600 wells per year).

In Mississippi, the estimated development of 10 new oil and gas wells from the BLM-administered FMO constitute less than a tenth of one percent (0.08 percent) of the total wells projected for the State over the 20 year planning period. Historically, the BLM-administered wells in Mississippi have comprised about the same percentage (0.09 percent), indicating a relatively constant although very small proportion of oil and gas development over time. Since the BLM-administered FMO oil and gas wells comprise so little of the total wells in the Mississippi, there are very little cumulative socioeconomic impacts that could be attributed with this anticipated BLM development.

Many of the cumulative socioeconomic impacts associated with oil and gas development are already occurring in the State and would be perpetuated in the future. For instance, oil and gas activity is generating employment opportunities and labor earnings for communities that support these types of activities. However, the employment and income from BLM-administered oil and gas is likely very low since it represents such a small proportion of the total development and production in Mississippi. With the increases in overall oil and gas development, socioeconomic characteristics and trends, such as infrastructure and community services, may be slightly increasing and better funded as fiscal revenues often support these types of services within the State.

The pace and timing of mineral development activities is dependent on a variety of factors beyond the management decisions of BLM. This includes national and international energy demand and prices, production factors within the planning area, and business strategies of operators. Because the pace of development in the planning area is only an estimate, actual cumulative impacts may vary if the oil and gas activity across the two states changes over the planning period.

Alternative 4 in this Draft RMP-EIS considers Federal disposal of the 174-acre Hancock County tract and this tract is likely to be used for recreation and research site purposes, with limited to no development occurring. The disposal of this tract of land would not likely have cumulative socioeconomic impacts as the acres represent such a small portion of total lands within the State, and the general management of the lands is not expected to change. For the socioeconomic impacts of the individual alternatives, please see Section 4.13.

Environmental Justice

Since the additional expected oil and gas activity locations for the BLM-administered non-USFS FMO have not been specified, impacts to these to these populations should be considered at the time of implementation. For Mississippi, Section 3.4.13 in Chapter 3 indicates the counties that comprise the largest low-income and minority populations. Once oil and gas development locations have been specified, Environmental Justice population locations should be revisited to assess any potential cumulative impacts to these populations.

Hazardous Materials

BLM-authorized activities on surface tracts and non-USFS FMO could include use of hazardous materials, substances, and waste (including storage, transportation, and spills). Such activities include oil and gas development, coal development, and application of pesticides to improve vegetative communities and wildlife habitat. These activities are conducted in compliance with 29 CFR 1910, 49 CFR 100-185, 40 CFR 100-400, CERCLA, RCRA, SARA, TSCA, and the CWA and other Federal and State regulations and policies regarding hazardous materials management. Therefore, if any releases were to occur, it would be immediately addressed and remediated in accordance with regulation and cumulative impacts are not anticipated. Contribution of hazardous materials, substances, and waste could occur from other sources on adjacent lands that could lead to cumulative impacts on BLM lands.

CHAPTER 5—CONSULTATION AND COORDINATION

5.1 OVERVIEW OF THE PROCESS

Consultation, coordination, and public involvement in preparing this Draft Resource Management Plan (RMP) and Environmental Impact Statement (EIS) have been accomplished through public and informal meetings, individual contacts, bulletins, news releases, and *Federal Register* notices.

Public involvement is mandated by several federal regulations and guidelines, including the Federal Land Policy and Management Act of 1976 (FLPMA), National Environmental Policy Act of 1969 (NEPA), and guidelines from the President’s Council on Environmental Quality (CEQ). In addition, the public participation process is outlined in the BLM Land Use Planning Handbook (H-1601-1).

5.2 CONSULTATION AND COORDINATION

This section documents the consultation and coordination efforts undertaken by the Bureau of Land Management (BLM) throughout the process of developing this Draft RMP-EIS. Because of jurisdictional responsibilities, BLM is required to consult with certain Federal, Native American, and State agencies and entities (40 Code of Federal Regulations [CFR] §1502.25) during the NEPA decision-making process. BLM is also directed to integrate NEPA requirements with other environmental review and consultation requirements to reduce paperwork and delays (40 CFR §1500.4-5).

Title II, Section 202 of FLPMA directs BLM to coordinate planning efforts with Native American tribes and Federal, State, and local government agencies as part of its land use planning process.

5.2.1 Other Federal Agency Consultation

Section 7 of the Endangered Species Act of 1973 (ESA) requires Federal agencies (such as BLM) to address impacts on species listed under ESA through consultations with the U.S. Fish and Wildlife Service (USFWS). Consultations begin informally when a Federal agency requests a list of species under ESA. If a listed species exists in the area being assessed, BLM may prepare a biological assessment (BA). The initial determination of effect is made by the lead agency, in this case BLM (50 CFR Part 420). If the BA determines that the proposed action may adversely affect a listed species or its habitat, BLM must enter formal consultation with USFWS, which then prepares a biological opinion (BO) that determines whether or not the preferred alternative would adversely affect listed species or critical habitat. Although the BO is based on information provided in the BA, it may concur with or dispute the determination of impact. The process of formal and informal consultation with USFWS ensures BLM actions conserve listed species and their critical habitat.

BLM has coordinated with the USFWS throughout the planning process to obtain a species list and develop best management practices (BMPs) and oil and gas leasing stipulations for the alternatives. BLM will consult with USFWS on the Proposed RMP and Final EIS. The goal is to not jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat, and where possible, to minimize the potential to adversely affect Federally-listed species.

5.2.2 State and Local Agency Consultation

Letters were sent to Alabama and Mississippi State agencies, county supervisors and commissioners, and the governors of both States to inform them of the RMP planning process. The States of Alabama and Mississippi were requested to be involved in the planning process as cooperating agencies. Only the State of Mississippi accepted the invitation to become an official cooperating agency.

The National Historic Preservation Act of 1966 (NHPA), as amended (16 United States Code [USC] 470), expands protection of historic and archeological properties to include those of national, state, and local significance. NHPA (in Section 106) requires Federal agencies to consult with the State Historic Preservation Office (SHPO), and sometimes with the Advisory Council on Historic Preservation, concerning the potential effects of agency actions on properties listed on or eligible for the National Register of Historic Places (NRHP). The SHPO is also sometimes consulted concerning applicable methods for determining whether or not there are NRHP-eligible properties in the area of potential effect of an agency undertaking, whether properties are eligible, and appropriate mitigation measures.

The SHPOs for both Mississippi and Alabama were informally contacted concerning potential effects to properties that are listed on or eligible for the NRHP. However, formal consultation has not yet occurred and will occur during the preparation of the Proposed RMP and Final EIS.

5.2.3 Native American Consultation

BLM provides government officials of Federally recognized tribes opportunities to comment on and participate in the development of the RMP. BLM considers comments, notifies consulted tribes of final decisions, and informs them of how their comments were addressed in those decisions. Land use plans and coordination activities must address consistency with tribal plans (Section 202(c)(9) of the FLPMA) and protection of treaty rights and comply with the following statutes and executive orders:

- **Section 101(d)(6) of the NHPA** requires BLM to consult with Native American tribes when historic properties of traditional religious or cultural importance to a tribe would be affected by BLM decision-making.
- **The American Indian Religious Freedom Act (AIRFA)** requires BLM to protect and preserve the freedom of American Indians and Alaska Natives to exercise their traditional religions, including access to sites and freedom to worship through ceremonial and traditional rites.
- **Executive Order 13007 (Indian Sacred Sites)** requires BLM to accommodate access to and use of sacred sites and to avoid adversely affecting the physical integrity of sacred sites to the extent practicable, as permitted by law and consistent with essential agency functions.
- **Executive Order 12898 (Environmental Justice)** requires BLM to take into account relevant CEQ guidelines and Department of the Interior policies and goals.

Specific guidance on Native American consultation is outlined in BLM Manual 8120 and BLM Handbook H-8120-1.

Land use plans and accompanying EISs must identify potential effects on Indian trust resources, trust assets, or tribal health and safety. Any effect must be explicitly identified and documented in the land use plan.

BLM contacted appropriate Native American tribes (see page 5-5 for a list of tribes contacted), inviting them to participate in the Alabama and Mississippi RMP-EIS development process, and offered to meet with tribal leaders or representatives in person to discuss issues, concerns, and questions they might have. The tribes contacted did not express interest is participating in meetings regarding the RMP-EIS nor becoming cooperating agencies.

5.3 PUBLIC SCOPING

Scoping is an early and open process for determining the scope of issues to be addressed in the planning process, as defined by 40 CFR Parts 1500 et seq. Scoping serves to solicit agency and public input on planning issues and criteria, areas of concern, and ideas and proposals for long-term management. Scoping provides a formal mechanism for engaging the public in identifying key planning and land management issues.

The official scoping period started with publication of the notice of intent (NOI) in the *Federal Register* on July 12, 2002, and ran through September 2002. The NOI announced BLM’s intent to prepare an RMP for Alabama and Mississippi, called for coal information, and invited the public to participate in identification of issues and review of planning criteria.

Letters were sent to Alabama and Mississippi state agencies, county supervisors and commissioners, and the governors of both states to inform them of the planning process. Letters were also sent to several coal companies to inform them of the planning process and solicit coal data. Individuals were encouraged to submit e-mail or hardcopy comments to the BLM Jackson Field Office.

One e-mail with comments was submitted during the scoping period. Comments addressed a variety of issues, such as the need to have adequate, site-specific data on threatened, endangered, and candidate species in the planning area, data on soils and aquatic species, and an accurate impact assessment of minerals development on recreation (BLM 2002).

A public workshop (with an emphasis on BLM tracts in Baldwin County, Alabama) was held in Gulf Shores, Alabama, on September 2, 2004, to solicit additional comments for developing alternatives. The workshop was conducted in an open house format, with resource stations and BLM staff available for individual discussions. Eight participants attended the workshop, including representatives from the Alabama State Lands Division. Information meetings with Baldwin County also took place during this period. Although BLM provided a deadline of November 30, 2004, to receive information and input via mail, e-mail, or the project Web site, none was submitted; however, BLM accepted input from the public and interested agencies throughout the planning process. Comment letters that were submitted after the November deadline dealt primarily with the Baldwin County land tracts and how they should be managed by BLM. All comments were collected, analyzed, and included in the project administrative record.

5.4 PROJECT WEB SITE

A project Web site was designed to provide the public with information on planning issues and the overall planning process, as well as the opportunity to submit input directly to BLM. The project Web site, www.es.blm.gov/AL_MS_RMP, became publicly accessible in August 2004 and featured information on resource and planning issues associated with the Alabama and Mississippi RMP. Information included *Federal Register* notices, planning bulletins, survey plats of BLM-administered public lands on Ft. Morgan Peninsula, a map of the planning area, a form allowing users to add their names to the project mailing list, and a form for users to submit input as part of the alternatives development process.

5.5 DEVELOPMENT OF PLANNING CRITERIA

The NOI also announced preliminary planning criteria—the framework of laws, regulations, policies, and guidance within which a resource management plan must be developed. Comments on the planning criteria were solicited during the scoping period. No comments were received; therefore, planning criteria presented in the NOI became final.

5.6 FUTURE PUBLIC PARTICIPATION

Upon distribution of the Draft RMP-EIS, public meetings will be held, and mailed, hand-delivered, or e-mailed comments will be accepted during the 90-day review period.

Following review of the Draft RMP-EIS, comments will be considered in preparation of a Proposed RMP and Final EIS to be released for a 30-day protest period. The Proposed RMP will also be sent to the governors of Alabama and Mississippi for a 60-day review for consistency with state or local plans, policies, and programs (43 CFR 1610.3-2). Finally, the Approved RMP/Record of Decision (ROD) will be prepared after any protests and inconsistencies have been resolved (43 CFR 1610.5-2).

5.7 DISTRIBUTION OF DRAFT RMP-EIS

Copies of the Draft RMP-EIS will be made available for public review at local libraries and other information repositories throughout the States of Alabama and Mississippi, as well as the Jackson Field Office and BLM-Eastern States Office. Prior to publication of the Draft RMP-EIS, a postcard announcing the anticipated date of its availability and how to request a hardcopy will be sent to everyone on the project mailing list. The Draft RMP-EIS will also be available in CD-ROM and can be viewed and downloaded from the project Web site (www.es.blm.gov/AL_MS_RMP). The following agencies and organizations have been asked to review the document:

5.7.1 Federal Agencies

- Army Corp of Engineers, Mobile District
- Army Corp of Engineers, Vicksburg District
- U.S. Department of Agriculture (USDA) Forest Service, National Forests in Alabama
- USDA Forest Service, National Forests in Mississippi
- USDA Natural Resource Conservation Service – Alabama
- USDA Natural Resource Conservation Service – Mississippi
- U.S. Fish and Wildlife Service, Ecological Office, Daphne, Alabama
- U.S. Fish and Wildlife Service, Ecological Office, Vicksburg, Mississippi
- U.S. Fish and Wildlife Service, Atlanta Regional Office
- Bon Secour National Wildlife Refuge
- National Park Service units in Mississippi
- National Park Service units in Alabama
- National Park Service, Atlanta Regional Office
- Federal Energy Regulatory Commission, Atlanta Regional Office

5.7.2 Alabama State Agencies

- Alabama Forestry Commission

- Alabama Department of Conservation and Natural Resources
- Alabama Department of Environmental Management
- Alabama Indian Affairs Commission
- Alabama State Historic Preservation Officer
- Alabama Natural Heritage Program
- Alabama State Parks Division
- Alabama State Lands Division
- State Oil and Gas Board
- Geological Survey of Alabama

5.7.3 Mississippi State Agencies

- Mississippi Development Authority
- Mississippi Department of Archives and History
- Mississippi Department of Environmental Quality
- Mississippi State Historic Preservation Officer
- Mississippi Forestry Commission
- Mississippi Department of Wildlife Fisheries and Parks
- Mississippi Natural Heritage Commission

5.7.4 Local Governments

Alabama

- All County Governments
- City of Bay Minette
- City of Daphne
- City of Elberta
- City of Fairhope
- City of Foley
- City of Gulf Shores
- City of Loxley
- City of Mobile
- City of Orange Beach
- City of Silverhill
- City of Spanish Fort
- City of Summerdale
- City of Robertsdale

Mississippi

- All County Governments
- City of Bay St. Louis
- City of Waveland
- City of Diamondhead
- City of Kiln

5.7.5 Native American Tribes

- Tunica-Biloxi Tribe
- Mississippi Band of Choctaw Indians
- Poarch Creek Indians
- Eastern Band of Cherokee Indians
- Oklahoma Indians whose homeland was in parts of Mississippi and Alabama
- Choctaw Nation of Oklahoma
- Cherokee Nation of Oklahoma
- United Keetoowah Band of Cherokee Indians
- Chickasaw Nation,

- Muscogee (Creek) Nation

5.7.6 U. S. Senate

- Hon. Jeff Sessions (Alabama)
- Hon. Richard Shelby (Alabama)
- Hon. Thad Cochran (Mississippi)
- Hon. Trent Lott (Mississippi)

5.7.7 U. S. House of Representatives

- Hon. Jo Bonner; Alabama 1st
- Hon. Terry Everett; Alabama 2nd
- Hon. Mike Rogers; Alabama 3rd
- Hon. Robert B. Aderholt, Alabama 4th
- Hon. Robert E. Cramer, Alabama 5th
- Hon. Spencer Bachus, Alabama 6th
- Hon. Artur Davis, Alabama 7th
- Hon. Roger F. Wicker, Mississippi 1st
- Hon. Bennie G. Thompson, Mississippi 2nd
- Hon. Charles W. Pickering, Mississippi 3rd
- Hon. Gene Taylor, Mississippi 4th

5.7.8 Organizations/Industry

- Dauphin Island Park and Beach Board
- Blakeley Historic State Park
- The Islander
- Weeks Bay Reserve
- South Alabama Sewer Service
- Dauphin Island Sea Lab
- The Noel Company
- Dauphin Island Sea Lab
- University of South Alabama
- Chickasabogue Park
- Colonial Bank Centre
- MS/AL Sea Grant Consortium
- Mobile Bay National Estuary Program
- Auburn Marine Extension Center
- Martinique on the Gulf
- The Beach Club
- Gulf Shores Plantation
- Alabama Coastal Foundation
- Fort Morgan Paradise Joint Venture
- Coastcom of Mississippi LLC
- Bubba’s Beach House LLC
- The Stirling Family Limited Partnership
- Kelley Bros
- J R J TARA INC
- Fort Morgan Volunteer Fire Department

- R & S LLC
- Wolford Brothers Leasing LLC
- Alabama Power Company
- University of Mississippi
- Mississippi Nature Conservancy

5.8 LIST OF PREPARERS

5.8.1 Introduction

The Alabama and Mississippi Draft RMP-EIS was prepared by a team of specialists from the Jackson Field Office and a contractor, Booz Allen Hamilton, with support from and review by the BLM-Eastern States Office and BLM Washington Office.

As required by NEPA regulations (40 CFR 1502.17), this section lists the people who were primarily responsible for preparing this EIS and presents their qualifications. Booz Allen Hamilton, a contractor selected to prepare the EIS as directed by BLM, in accordance with 40 CFR 1506.5(c), has certified that it does not have any financial or other interest in the decisions to be made pursuant to this EIS. In addition to being responsible for the projects and areas listed, many BLM employees also contributed substantial time consulting with other agency personnel in preparing this EIS (see Section 5.7).

Table 5-1. BLM Preparers

Contributor	Project Role	Qualifications
Ken Adams	Geologist	B.S., Geology, University of Florida Years of experience: 28
Shayne Banks	Public Affairs Specialist	B.A., History, Mississippi State University Years of experience: 16
Bruce Dawson	Field Office Manager	M.S., Natural Resources Management, Humbolt State University Years of experience: 28
Stuart Grange	Mining Engineer	B.S., Mining Engineering, University of Utah M.B.A., University of Nevada, Reno Years of experience: 17
Brian Kennedy	Physical Scientist (Geographic Information System (GIS) Assistance)	B.S., Geographic Information Technology, University of Southern Mississippi Years of experience: 5
Judith Pace	Archaeologist	B.A., History and Anthropology, University of Mississippi, Oxford M.A., Anthropology, University of Mississippi, Oxford Years of experience: 20
Bob Schoolar	GIS Specialist	B.S., Geophysical Science, Old Dominion University Years of experience: 30
Gary Taylor	Planning and Environmental Coordinator (BLM Contracting Officer Representative)	M.A., Management, Webster University Years of experience: 5

Contributor	Project Role	Qualifications
Mary Weaver	Realty Specialist	B.S., Business Administration, Florida State University (3.5 years) Business, University of Maryland Years of experience: 31
Duane Winters	Project Manager	M.S., Forest Hydrology, University of Missouri, Columbia Years of experience: 28
Faye Winters	Wildlife Management Biologist	B.A., Biology, William Woods College Years of experience: 29

Table 5-2. Booz Allen Hamilton Preparers

Contributor	Project Role	Qualifications
Erik Anderson	Assistant Project Manager, Minerals/Geology Specialist	B.S., Civil and Environmental Engineering, Utah State University M.S., Environmental Policy and Management, University of Denver (pursuing) Years of experience: 8
Dean Bibles	Public Lands Advisor	B.S., Range Management, Texas A&M University Years of experience: 45
Quincy Bahr	Natural and Cultural Resource Specialist	B.S., Natural Resources Management & Planning, University of Utah Years of experience: 8
Michael Ghazizadeh	Minerals Specialist (Coal Screening Report development)	B.S., Geology, University of Isfahan M.S., Geology, Northeast Louisiana University PhD., Geology, University of Tennessee Years of experience: 20
Joel Hanson	GIS and Mapping Specialist	B.S., Geography and Environmental Studies, University of Colorado M.A.S., Environmental Information Management (pursuing), University of Denver Years of experience: 4
Chris Keefe	NEPA Specialist, Technical Review, Soils Sections	B.S., Biology, University of Nebraska Years of experience: 14
Bryan Klyse	Natural Resource Specialist	B.A., Social Science (Environment), San Diego State University M.E.S.M., Environmental Science and Management, University of California, Santa Barbara Years of experience: 7
Melanie Martin	Project Manager, NEPA Lead, Alternatives Development, Technical Review, Natural Resource Specialist	B.S.A, Environmental Protection, West Virginia University M.S., Natural Resource Management, University of Denver Years of experience: 8

Contributor	Project Role	Qualifications
Pamela Middleton	Natural Resource Specialist	B.A., Biology (Botany emphasis) Minor in Environmental Studies and Planning, Sonoma State University M.A.S., Environmental Policy and Management, University of Denver Years of experience: 7
Amanda Pryor	NEPA Specialist, Technical Review	B.A., Biology, Baylor University, Texas M.S., Environmental Biology, Baylor University, Texas Years of experience: 10
Jason Smiley	GIS and Mapping Specialist	B.S.E.D., Park Administration M.S., Geography
Mike Sumner	Document Preparation	B.S., Recreation Resource Management , Utah State University Years of experience: 7

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LIST OF ABBREVIATIONS AND ACRONYMS

ACAMP	Alabama Coastal Area Management Program
ACEC	Area of Critical Environmental Concern
ACNPCP	Alabama Coastal Nonpoint Source Pollution Control Program
ADEM	Alabama Department of Environmental Management
AFC	Alabama Forestry Commission
AIRFA	American Indian Religious Freedom Act
ANHP	Alabama Natural Heritage Program
ARPA	Archaeological Resources Protection Act
BA	Biological Assessment
BEA	Bureau of Economic Analysis
BLM	Bureau of Land Management
BLS	Bureau of Labor Statistics
BMP	Best Management Practice
BO	Biological Opinion
B.P.	Before Present
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
COA	Condition of Approval
CRMP	Comprehensive Resource Management Plan
CSU	Controlled Surface Use
CWA	Clean Water Act
CWCS	Comprehensive Wildlife Conservation Strategy
CZM	Coastal Zone Management
DMR	Department of Marine Resources
DoD	Department of Defense
EA	Environmental Analysis
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ERMA	Extensive Recreation Management Area
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
FLPMA	Federal Land Policy and Management Act of 1976
FMO	Federal Mineral Ownership
FPC	Federal Power Commission
FRL	Fractional
GAP	Gap Analysis Program
GIS	Geographic Information Systems
GSA	Geological Survey of Alabama
JFO	Jackson Field Office (BLM)
LBA	Lease by Application
mcf	thousand cubic feet
MDEQ	Mississippi Department of Environmental Quality
MFC	Mississippi Forestry Commission
MNHP	Mississippi Natural Heritage Program
MOU	Memorandum of Understanding
MSCZMP	Mississippi Coastal Zone Management Program

NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act of 1966, as amended
NLCD	National Land Cover Data
NO_2	Nitrogen Dioxide
NO_X	Nitrogen Oxides
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
NRI	National Resources Inventory
NSO	No Surface Occupancy
NWI	National Wetland Inventory
NWR	National Wildlife Refuge
O_3	Ozone
PCB	Polychlorinated Biphenyl
$PM_{2.5}$	Particulate Matter (less than 2.5 microns in diameter)
PM_{10}	Particulate Matter (less than 10 microns in diameter)
ppm	parts per million
PSD	Prevention of Significant Deterioration
R&PP	Recreation and Public Purposes Act
RCRA	Resource Conservation and Recovery Act
RFDS	Reasonably Foreseeable Development Scenario
RMP	Resource Management Plan
ROD	Record of Decision
ROW	Right-of-Way
ROWs	Rights-of-Way
S-1	BLM Eastern States Sensitive Species Designated as “Critically Imperiled”
S-2	BLM Eastern States Sensitive Species Designated as “Imperiled”
SARA	Superfund Amendment Reauthorization Act
SHPO	State Historic Preservation Office
SIP	State Implementation Plan (Air Quality)
SO_2	Sulfur Dioxide
SRMA	Special Recreation Management Area
TDS	Total Dissolved Solids
TSCA	Toxic Substances Control Act
TVA	Tennessee Valley Authority
USC	United States Code
USFS	U. S. Forest Service
USFWS	U. S. Fish and Wildlife Service
USGS	U. S. Geological Survey
VOC	Volatile Organic Compound
VRM	Visual Resource Management
WUI	Wildland-Urban Interface

GLOSSARY

Activity Plan. A site-specific plan for the management of one or more resources, e.g., allotment management plan or habitat management plan. Activity plans provide the additional detail necessary to implement decisions made in the Resource Management Plan.

Administrative Use. Official use related to management and resources of the public lands by Federal, State or local governments or non-official use sanctioned by an appropriate authorization instrument, such as right-of-way, permit, lease, or maintenance agreement.

Aquifer. A geologic formation, group of formations, or part of a formation that contains sufficient saturated, permeable material to be able to yield significant quantities of water to wells and springs.

Archaeological Site. Geographic locale containing structures, artifacts, material remains, and/or other evidence(s) of past human activity.

Area of Critical Environmental Concern (ACEC). An area within the pubic lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards.

Attainment Area. Any area not meeting Ambient Air Quality Standards and designated as such by 17-275.410 F.A.C.

Candidate Species. Candidate species are any species not yet officially listed, but which are undergoing a status review or are proposed for listing according to Federal Register notices published by the Secretary of the Interior or the Secretary of Commerce.

Closed. Designated areas, routes, roads and trails where OHV use is permanently or temporarily prohibited. Use by emergency vehicles is allowed.

Collocate. To set side-by-side.

Controlled Surface Use (CSU). A fluid minerals leasing constraint under which use and occupancy is allowed (unless restricted by another stipulation), but identified resource values require special operational limitations that may modify lease rights.

Critical Habitat. Any habitat, which if lost, would appreciably decrease the likelihood of the survival and recovery of a threatened or endangered species, or a distinct segment of its population. Critical habitat may represent any portion of the present habitat of a listed species and may include additional areas for reasonable population expansion. Critical habitat must be officially designated by the USFWS or the National Marine Fisheries Services.

Cultural Resource. The fragile and nonrenewable remains of human activity, occupation, or endeavor reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, and natural features that were of importance in human events. These resources consist of (1) physical remains, (2) areas where significant human events occurred even though evidence of the event no longer remains, and (3) the environment immediately surrounding the resource.

Cumulative Impact. The impact on the environment which results from the incremental impact of the action when added to past, present, and reasonable foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Disposal. Transfer of ownership of a tract of public land from the United States to another party.

Dune Walkover. A raised walkway constructed for the purpose of protecting the beach and dune system between mean high tide and the construction control line from damage that may result from anticipated pedestrian traffic to the beach and which is no more than six feet in width, constructed without roof or walls, elevated at least one foot above the dune, and extends seaward of the seaward vegetation line.

Endangered Species. Any species formally recognized by the USFWS as in danger of extinction throughout all or a significant portion of its range.

Endangered Species. Any species formally recognized by the USFWS as in danger of extinction throughout all or a significant portion of its range.

Extensive Recreation Management Area (ERMA). A public lands unit identified in land use plans containing all acreage not identified as an Special Recreation Management Area (SRMA). Recreation Management Actions within an ERMA are limited to only those of a custodial nature.

Fault traps. An oil or gas trap in which the closure results from the presence of one or more faults.

Federal Land Policy and Management Act of 1976 (FLPMA). Public Law 94-579, which gives the BLM legal authority to establish public land policy, to establish guidelines for administering such policy, and to provide for the management, protection, development, and enhancement of public land.

Federal Mineral Ownership (FMO). Lands on which either the entire mineral estate or certain mineral rights are owned by the federal government.

Flooding. The temporary covering of the soil surface by water from any source. Shallow water standing during or shortly following rain is excluded from the definition of flooding. Marshes and swamps are excluded from the definition of flooding because water is more than a temporary covering.

Groundwater. Water within the earth that supplies wells and springs.

Habitat. A specific set of physical conditions that surround a single species, a group of species, or a large community. In wildlife management, the major components of habitat are considered to be food, water, cover, and living space.

Herbaceous. A plant with little or no woody tissue that dies back at the end of the growing season.

Historic. Refers to period wherein non-Native cultural activities, based primarily upon European roots, take place and having no origin in traditional Native American culture(s).

Hydrocarbons. Organic chemical compounds of hydrogen and carbon atoms that form the basis of all petroleum products, including oil and gas.

Interdisciplinary. Characterized by interactive participation or cooperation of two or more disciplines or fields of study.

Intermittent Stream. A stream that does not flow year round but has some association with ground water for surface or subsurface flows.

Leasable Minerals. Those minerals or materials that can be leased.

Lease (Mineral). A contract between an owner of mineral rights and another, granting the latter the right to search for and produce gas, hydrocarbons, or other mineral substances upon payment of an agreed-upon rental and royalties based on production.

Lease Notice. Provides more detailed information concerning limitations that already exist in law, lease terms, regulations, or operational orders. A lease notice also addresses special items the lessee would consider when planning operations, but does not impose new or additional restrictions.

Lease Stipulation. A modification of the terms and conditions on a standard lease form at the time of the lease sale. (See also No Surface Occupancy, Controlled Surface Use and Seasonal Limitation.)

Limited OHV area. An area restricted at certain times, in certain areas, and(or) to certain vehicular use. These restrictions may be of any type, but can generally be accommodated within the following type of categories: Numbers of vehicles; types of vehicles; time or season of vehicle use; permitted use only; use on existing roads and trails; use on designated roads and trails; and other restrictions (from BLM National Management Strategy for OHV Use on Public Lands).

Locatable Minerals. Minerals or materials subject to disposal and development through the Mining Law of 1872, (as amended). Generally includes metallic minerals such as gold and silver and other materials not subject to lease or sale (such as some bentonites, limestone, talc, and some zeolites).

Mesic. Related to conditions of moderate moisture or water supply. Used to describe organisms occupying moist habitats.

National Environmental Policy Act (NEPA) of 1969. Public Law 91-190, which established environmental policy for the nation. Among other items, NEPA requires federal agencies to consider environmental values in decision-making processes.

National Register of Historic Places (NRHP). A register of districts, sites, buildings, structures, and objects, significant in American history, architecture, archaeology, and culture, established by the National Historic Preservation Act of 1966 and maintained by the Secretary of the Interior.

No Surface Occupancy (NSO). A fluid minerals leasing constraint that prohibits occupancy or disturbance on all or part of the lease surface to protect special values or uses. Lessees may exploit the fluid mineral resources under the leases restricted by this constraint through use of directional drilling from sites outside the NSO area.

Non-attainment Area. Any area not meeting Ambient Air Quality Standards and designated as such by 17-275.410 F.A.C.

Occurrence. A specific record of a single or group of plant or animal species.

Off-Highway Vehicle (OHV). This term replaces “off-road vehicle (ORV)”, and means any motorized vehicle capable of or designed for travel on or immediately over land, water, or other natural terrain.

Open. Designated areas, routes, roads, and trails where unrestricted OHV use may occur (subject to operating regulations and vehicle standards set forth in BLM Manuals 8341 and 8343 and 161.053 and 161.58 F.A.C.).

Prehistoric. Refers to period wherein Native American cultural activities took place which were not yet influenced by contact with historic non-native cultures.

Prime Farmland. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is available for these uses (the land could be cropland, pastureland, rangeland, forest land, or other land, but not urban built-up land or water).

Public Domain. Public lands which were originally (that is upon the admittance of a state to the United States) owned the federal government and have since that time remained in continuous federal ownership.

Public Domain Leases. Federal mineral leases of mineral interests which were originally (that is upon the admittance of a state to the United States) owned the federal government and have since that time remained in continuous federal ownership.

Public Lands. Any land and interest in land owned by the United States that are administered by the Secretary of the Interior through the Bureau of Land Management, without regard to how the United States acquired ownership, except for (1) lands located on the Outer Continental Shelf, and (2) lands held for the benefit of Indians, Aleuts, and Eskimos. Includes public domain and acquired lands.

Reasonably Foreseeable Development (RFD). A description of anticipated future development of minerals or other resources, used as a basis for assessing the environmental impacts of RMP decisions.

Reserved Lands. Federal lands that are dedicated or set aside for a specific public purpose or program and that are, therefore, generally not subject to disposition under the operation of all of the public land laws. (See also Withdrawal.)

Recreation and Public Purposes (R&PP). Refers to both the Recreation and Public Purposes Act (43 U. S.C. 869(a)) and the uses to be made of public land transferred under the act. The objective of the R&PP Act is to meet the needs of state and local government agencies and nonprofit organizations by leasing or conveying public land required for recreation and public purposes uses. Examples of uses made of R&PP lands are parks, schools, religious facilities, and camps for youth groups. Transfer of land ownership under the provisions of R&PP Act is referred to as R&PP conveyance.

Right-of-Way. The public or federal land authorized to be used or occupied pursuant to a right-of-way grant.

Right-of-Way Grant. A document authorizing the use of public or federal lands for the construction, operation, maintenance, and termination of a project (e.g., utility line, road).

Riparian. Situated on or pertaining to the bank of a river, stream, or other body of water. Normally used to refer to the plants of all types that grow rooted in the water table of streams, ponds, and springs.

Riparian Area. Riparian areas are a form of wetland transition between permanently saturated wetlands and upland areas. These areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water influence. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil.

Salable Minerals. Minerals that may be sold under the Material Sale Act of 1947, as amended. Included are common varieties of sand, stone, gravel, and clay.

Scoping Process. An early and public process for determining the nature, significance, and range of issues to be addressed related to a proposed action.

Seasonal Limitation. A fluid minerals leasing constraint that prohibits surface use during specified time periods to protect identified resource values. The constraint does not apply to the operation and maintenance of production facilities unless analysis demonstrates that such constraints are needed and that less stringent, project- specific constraints would be insufficient.

Sensitive Species. See Special Status Species.

Significance. A high degree of importance as indicated by either quantitative measurements or qualitative judgments. Significance may be determined by evaluating characteristics pertaining to location extent, consequences, and duration.

Soil Association. A mapping unit used on general soil maps in which two or more defined taxonomic units occurring together in a characteristic pattern are combined because the scale of the map or the purpose for which it is being made does not require delineation of the individual soils.

Special Recreation Management Area (SRMA). An area where special management or intensive recreation management is needed. Recreation activity plans are required, and greater managerial investment in facilities or supervision can be anticipated.

Special Status Species. All Federal and state-listed, species proposed or candidates for Federal or state listing, and those species identified by BLM as sensitive species. BLM Eastern States policy designates as “BLM sensitive” those additional species that are considered to be critically imperiled (S-1) or imperiled (S-2) by the state Natural Heritage programs.

Species of Concern. Species that are not yet listed as endangered or threatened, but that are undergoing a status review. This may include species whose populations are consistently and widely dispersed or whose ranges are restricted to a few localities, so that any major habitat change could lead to extinction. A species that is particularly sensitive to some external disturbance factors.

Split-Estate Lands. A given land area where the surface and mineral estates are in different ownerships. Most often split-estate areas occur where the surface is owned by private individuals, corporations, or groups or by state or local government, and the minerals are federally owned.

Surface Managing Agency. An agency of the federal government which has the primary responsibility for management of a particular are of land, such as the Forest Service, National Park Service, the Navy, Air Force, or the BLM.

Surficial. Pertaining to or lying in or on a surface; the surface of the earth; e.g. “surficial weathering” of a rock, or a “surficial structure” formed by creep.

Surficial Aquifer. These aquifers consist of sand and shell deposits with uppermost layers contiguous with the land surface.

Threatened Species. Any species formally recognized by the USFWS as likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Unique Farmland. Unique farmland is land other than prime farmland that is used for the production of specific high value food and other fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality and/or high yields of a specific crop when treated and managed according to acceptable farming methods. Examples of such crops are citrus, tree nuts, olives, cranberries, fruit, and vegetables.

Valid Existing Rights. Legal "rights" or interest that are associated to a land or mineral estate and that cannot be divested from the estate until that interest expires or is relinquished. Lands within the decision area are subject to various authorizations, some giving "rights" to the holders and some of which could be construed as providing valid, but lesser, interests. Valid existing rights are established by various laws, leases, and filings under Federal law.

Mineral: Authorizations for activities on existing mineral leases and mining claims are governed by valid existing rights. Valid existing rights vary from case to case with respect to oil and gas leases, mineral leases, and mining claims, but generally involve rights to explore, develop, and produce within the constraints of laws, regulations, and policies at the time the lease/claim was established or authorized.

Non-Mineral: There are other situations, unrelated to minerals, in which BLM has authorized some use of public land or has conveyed some limited interest in public land. The authorization may be valid and existing and may convey some "right" or interest. Many rights of way, easements, and leases granted on public land are this type of valid existing right. These types vary from case to case, but the details of each one are specified in the authorizing document. Valid and existing authorizations of this type would continue to be allowed subject to the terms and conditions of the authorizing document.

Access: The presence of non-federal land within the decision area has implications for valid existing rights because owners of non-Federal land surrounded by public land are entitled to reasonable access to their land. Reasonable access is defined as access that the Secretary of the Interior deems adequate to secure the owner reasonable use and enjoyment of the non-Federal land. Such access is subject to rules and regulations governing the administration of public land. In determining reasonable access, the BLM has discretion to evaluate and would consider such things as proposed construction methods and location, reasonable alternatives, and reasonable terms and conditions as are necessary to protect the public interest and resources of the decision area.

Other: There are a variety of other land use authorizations that do not involve the granting of legal "rights" or interests. Outfitter and guide permits are an example. These permits authorize certain uses of public land for a specified time, under certain conditions, without conveying a right, title, or interest in the land or resources used. If at any time it is determined that an outfitter and guide permit, other such permit, or any activities under those permits, are not consistent with the approved Resource Management Plan, then the authorization would be adjusted, mitigated, or revoked where legally possible. Grazing permits are also in this category. Grazing permits or leases convey no right, title, or interest in the land or resources used. Other applicable laws and regulations govern changes to existing grazing permits and levels of livestock grazing.

Visual Resource Management (VRM). The planning, designing, and implementation of management objectives for maintaining scenic value and visual quality on public lands.

Visual Resource Management (VRM) Classes. Visual resource management classes define the degree of acceptable visual change within a characteristic landscape. A class is based on the physical and sociological characteristics of any given homogeneous area and serves as a management objective. There are four classes. Each class has an objective which prescribes the amount of change allowed in the characteristic landscape, as described below:

Class I: The objective for VRM Class I is to preserve the existing character of the landscape. This class provides for natural ecological changes; it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention,

Class II: The objective for VRM Class II is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color and texture found in the predominant natural features of the characteristic landscape,

Class III: The objective for VRM Class III is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Any changes should repeat the basic elements of form, line, color and texture found in the predominant natural features of the characteristic landscape, and

Class IV: The objective for VRM Class IV is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements of form, line, color and texture found in the predominant natural features of the characteristic landscape.

Warrior Basin. A geologic province comprising parts of the states of Alabama, Mississippi and Tennessee, including areas of potential coal and coalbed methane production.

Black Warrior Basin. The drainage area of the Black Warrior River.

Wetlands. Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Withdrawal. Removal or withholding an area of Federal land from settlement, sale, location, or entry, under some or all of the general land laws, for the purpose of limiting activities under those laws in order to maintain other public values in the area or reserving the area for a particular public purpose or program; or transferring jurisdiction over an area of Federal land, other than “property” governed by the Federal Property and Administrative Services Act, as amended (40 U.S.C. 472) from one department, bureau or agency to another department, bureau or agency (from FLPMA, Title 43 Chapter 35 Subchapter I 1702[j]).

Woodland. Forest land on which trees are present but form only an open canopy, the intervening areas being occupied by lower vegetation. Forest lands which produce or are capable of producing no more than 20 cubic feet per acre per year of commercially important tree species.

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APPENDIX A—RECREATION AND PUBLIC PURPOSES ACT LANDS

The following tracts in Alabama and Mississippi are leased under the Recreation and Public Purposes (R&PP) Act of 1926 [(43 U.S.C. 869(a)]. The objective of the R&PP Act is to meet the needs of State and local government agencies and nonprofit organizations by leasing or conveying public land required for recreation and public purpose uses. Examples of uses made of R&PP lands are parks and greenbelts, sanitary landfills, schools, religious facilities, and camps for youth groups. The R&PP Act provides substantial cost-benefits for land acquisition and provides for recreation facilities or historical monuments at no cost.

Table A-1. R&PP Lands in Alabama

Name/County	Legal Description	File Number	Acres
Chilton County Board of County Commissioners Wilderness Park	St. Stephens Meridian T. 23 N., R. 15 E., Sec. 12, NE	AL-BLM-75393	86.10
Chilton County Board of County Commissioners Minoka Park	St. Stephens Meridian T. 24 N., R. 13 E., Sec., Fractional (FRL) NW	AL-ES-000327	160.00
City of Tuscaloosa Tuscaloosa County	Huntsville Meridian T. 20 S., R. 10 W., Sec. 12, FRL SENE	AL-ES-004206	40.00
State of Alabama Department of Natural Resources	St. Stephens Meridian Cleburne County: T. 17 S., R. 8 E., Sec. 34, NE, SW, S2NW;	AL-GLO-005700	399.40
	Shelby County: T. 19 S., R. 2 W., Sec. 26, S2SE;		79.84
	Sec. 34, SESE;		40.24
	T. 20 S., R. 2 W, Sec. 4, SE;		160.33
	Sec. 8, E2SE		79.88

Name/County	Legal Description	File Number	Acres
State of Alabama	Huntsville Meridian Cherokee County: T. 8 S., R. 9 E., Sec. 1, Lots 1-4; Sec. 2, Lots 1-3; Sec. 10, Lots 1, 2; Sec. 11, Lots 1-6; Sec. 12, Lot 1; Sec. 14, Lots 1-3; Sec. 15, Lots 1-4; Sec. 22, Lots 1-4; Sec. 23, Lots 1-4; Sec. 26, Lots 1, 2; Sec. 27, FRL E2NE; Sec. 27, Lots 1-5; Sec. 28, Lot 1; Sec. 33, Lots 1-4; Sec. 34, Lots 1-2 Dekalb County: T. 8 S., R. 9 E., Sec. 1, Lots 1-4; Sec. 2, Lots 1-3; Sec. 10, Lots 1, 2; Sec. 11, Lots 1-6; Sec. 15, Lots 1-4;	AL-GLO-006108	1,625.19
Total			**2,670.98**

Table A-2. R&PP Lands in Mississippi

Agency/Use	Legal Description	Serial/PLO No.	Acres
City of Pascagoula Jackson County	St. Stephens Meridian T. 9 S., R. 6 W., Sec. 3, Lot 1; Sec. 4, Lot 1	MS-ES-035036	48.92
University of Mississippi Hancock County	St. Stephens Meridian T. 9 S., R. 15 W., Sec. 24, NWSW, N2SWSW, SWSWSW, W2W2SESWSW; Sec. 25, SESE, Lots 2-5; T. 9 S., R. 16 W., Sec. 35, Lot 2	MS-BLM-045650	274.89
Total			**323.81**

APPENDIX B—LANDS OF UNCERTAIN TITLE

For some tracts of land the title is clouded. These tracts are claimed by private owners, but government land records show that they were never transferred from federal ownership. Claimants may apply for transfer of these tracts under the Color-of-Title Act and, if qualified, purchase the tracts to obtain title. Color-of-Title Act cases will be processed on a case-by-case basis. The following tables list tracts in Alabama and Mississippi that appear to be of uncertain title.

Table B-1. Lands of Uncertain Title in Alabama

County	Legal Description	Acres
Baldwin	St. Stephens Meridian	
	T. 8 S., R. 3 E., Sec 5, Fractional (FRL) Sec	13.96
Barbour	St. Stephens Meridian	
	T. 11 N., R. 24 E., Sec 27, W2NE	80.00
Calhoun	Huntsville Meridian	
	T. 13 S., R. 9 E., Sec 28 SE	160.40
	T. 14 S., R. 5 E., Sec 13, LOT 1	0.04
	T. 14 S., R. 6 E., Sec 18, LOT 1, LOT 2	0.38, 1.32,
	Sec 19, LOT 2, LOT 3	0.19, 0.46
	T. 14 S., R. 9 E., Sec 6, SWSE	40.00
Cherokee	Huntsville Meridian	
	T. 8 S., R. 9 E., Sec. 33, SENW	40.00
	T. 9 S., R. 11 E., Sec. 31, LOT 1	11.97
	Sec. 32, LOT 2	1.82
	T. 10 S., R. 8 E., Sec. 32, LOT 1	0.24
	Sec. 33, LOT 1	1.36
Choctaw	St. Stephens Meridian	
	T. 15 N., R. 1 W., Sec. 27, SWSE	38.89
Clarke	St. Stephens Meridian	
	T. 5 N., R. 5 E., Sec 4 E2NE	80.00
	T. 12 N., R. 2 E., Sec. 32, SWNE	39.95
Clay	Huntsville Meridian	
	T. 22 S., R. 5 E., Sec 6, E2SW, SENW,	80.00, 39.40
Cleburne	Huntsville Meridian	
	T. 17 S., R. 8 E., Sec. 34, NE, SW, S2NW	160,00, 160.00, 79.40
Coosa	St. Stephens Meridian	
	T. 22 N., R. 16 E., Sec. 5, LOT A, LOT B, LOT C	51.75, 34.00, 36.60
Etowah	Huntsville Meridian	
	T. 11 S., R. 7 E., Sec. 2, LOT 1	4.20
	Sec. 11, LOT 1	2.98
	Sec. 22, LOT 1	2.33
	Sec. 36, LOT 1	3.60

County	Legal Description	Acres
Franklin	Huntsville Meridian	
	T. 7 S., R. 10 W., Sec. 6, SESW	40.00
Hale	St. Stephens Meridian	
	T. 20 N., R. 3 E., Sec. 5, LOT C, LOT F	68.00, 108.00
Lamar	Huntsville Meridian	
	T. 15 S., R. 15 W., Sec. 14, NWSW	40.96
	Sec. 15, NESE	39.84
	T. 15 S., R. 16 W., Sec. 14, SENE	40.05
	T. 16 S., R. 16 W., Sec. 18, FRL Sec	17.15
	Sec. 20, NWNE	39.95
	T. 17 S., R. 14 W., Sec. 17, NESW	40.98
Lauderdale	Huntsville Meridian	
	T. 3 S., R. 11 W., Sec. 5, W2SE	80.00
Lowndes	St. Stephens Meridian	
	T. 12 N., R. 12 E., Sec. 12, NESE	40.00
Marengo	St. Stephens Meridian	
	T. 13 N., R. 2 E., Sec. 2, SESE	40.31
	Sec. 12, W2NE, E2NW	80.00, 79.25
	Sec. 18, E2NE	71.88
	Sec. 20, SESE	40.31
	T. 13 N., R. 4 E., Sec. 3, NWNE	40.00
	T. 14 N., R. 2 E., Sec. 25, E2SW	80.02
	Sec. 31, S2NE, S2NENE, NESE	80.00, 19.83, 40.00
	Sec. 32, NESE	40.05
Mobile	St. Stephens Meridian	
	T. 4 S., R. 4 W., Sec. 12, SENE	40.00
Monroe	St. Stephens Meridian	
	T. 5 N., R. 5 E., Sec. 4, E2NE	80.00
	T. 9 N., R. 10 E., Sec. 29, W2NW	80.02
Morgan	Huntsville Meridian	
	T. 7 S., R. 1 W., Sec. 6, SESW	40.00
	T. 8 S., R. 1 W., Sec. 26, S2NW	80.00
St. Clair	Huntsville Meridian	
	T. 18 S., R. 4 E., Sec. 5, S2NENE	80.00
Shelby	Huntsville Meridian	
	T. 21 S., R. 2 E., Sec. 6, LOT 1	0.20
	Sec. 7, LOT 1, LOT 2, LOT 3, LOT 4, LOT 5	1.00, 0.70, 1.80, 0.09, 2.14
	Sec. 8, LOT 1, LOT 2	0.04, 0.50
Sumter	Huntsville Meridian	
	T. 20 S., R. 1 W., Sec. 33	160.00

County	Legal Description	Acres
Talladega	Huntsville Meridian	
	T. 18 S., R. 3 E., Sec. 26, NWSE	40.00
	T. 18 S., R. 4 E., Sec. 5, S2NE	80.00
Winston	Huntsville Meridian	
	T. 10 S., R. 6 W., Sec. 26, NENE	40.00

Table B-2. Lands of Uncertain Title in Mississippi

County	Legal Description	Acres
Carroll	Choctaw Meridian	
	T. 21 N., R. 2 E., Sec 19, LOT 13	3.00
Clairborne	Washington Meridian	
	T. 11 N., R. 3 E., Sec. 16, LOT 1	150.15
	T. 12 N., R. 1 E., Sec. 2, FRL Sec	313.00
	T. 12 N., R. 2 E., Sec. 27, FRL Sec	29.43
	T. 12 N., R. 3 E., Sec. 3, LOT 7	24.00
	Sec. 4, LOT 8	15.00
	T. 13 N., R. 3 E., Sec. 55, FRL Sec	184.19
	T. 13 N., R. 4 E., Sec. 64, W2SE	82.23
Copiah	Washington Meridian	
	T. 9 N., R. 8 E., Sec. 28 or 33, W2NW	80.00
	T. 9 N., R. 9 E., Sec 4	40.00
Covington	St. Stephens Meridian	
	T. 8 N., R. 14 W., Sec. 4, NENE	40.75
Franklin	Washington Meridian	
	T. 5 N., R. 4 E., Sec. 36, NW	160.00
	T. 6 N., R. 2 E., Sec. 35, NENW	40.00
	T. 6 N., R. 3 E., Sec. 15, NENE	41.07
Green	St. Stephens Meridian	38.75
	T. 4 N., R. 7 W., Sec. 5, NENE	
Grenada	Choctaw Meridian	40.00
	T. 22 N., R. 6 E., Sec 19, NESE	
Holmes	Choctaw Meridian	
	T. 15 N., R. 3 E., Sec. 9, S2	318.20
	Sec. 15, LOT 19	39.36
	Sec. 25, SWSW	40.00
	Sec. 36, NWNW	40.00
	T. 16 N., R. 3 E., Sec. 25, NWNW	35.02
Jefferson	Washington Meridian	
	T. 8 N., R. 1 E., Sec. 54, LOT 1, LOT 2, LOT 3	91.05, 130.23, 136.54
Jones	St. Stephens Meridian	
	T. 8 N., R. 14 W., Sec. 4, NENE	40.75

County	Legal Description	Acres
Kemper	Choctaw Meridian T. 10 N., R. 16 E., Sec. 1, SWSE, SESW	38.11, 38.11
Lauderdale	Choctaw Meridian T. 5 N., R. 18 E., Sec. 27, NWSE T. 8 N., R. 18 E., Sec. 19, SWSE Sec. 22, NESE	40.08 39.59 40.00
Lawrence	Washington Meridian T. 9 N., R. 10 E., Sec. 26, E2SE	80.00
Lowndes	Huntsville Meridian T. 17 S., R. 19 W., Sec. 14, FRL Sec.	52.25
Montgomery	Choctaw Meridian T. 19 N., R. 7 E., Sec. 30, E2NW, SWNE	119.77
Neshoba	Choctaw Meridian T. 12 N., R. 10 E., Sec. 18, NENE T. 12 N., R. 12 E., Sec. 19, SWNW	39.93 40.00
Newton	Choctaw Meridian T. 6 N., R. 12 E., Sec. 10, All Sec. 21, SENE	639.90 40.00
Quitman	Choctaw Meridian T. 27 N., R. 1 E., Sec. 13, W2SW	80.00
Rankin	Choctaw Meridian T. 4 N., R. 4 E., Sec. 27, NENE	40.00
Scott	Choctaw Meridian T. 7 N., R. 9 E., Sec. 5, E2SE Sec. 6, SENE	85.43 40.00
Smith	Choctaw Meridian T. 4 N., R. 6 E., Sec. 9, LOT 14 T. 2 N., R. 9 E., Sec. 14 SENW	40.10 40.00
Tallahatchie	Choctaw Meridian T. 23 N., R. 3 E., Sec. 8, LOT 2 T. 26 N., R. 3 E., Sec. 23, NE, SENW, SWNW	12.69 160.00, 40.00, 37.00
Walthall	Washington Meridian T. 3 N., R. 11 E., Sec. 18, S2SE	80.00
Warren	Washington Meridian T. 13 N., R. 2 E., Sec. 17 FRL Sec. T. 14 N., R. 1 E., Sec. 30 FRL Sec. (island) T. 14 N., R. 3 E., Sec. 12, NW Sec. 18, SE Sec. 27, W2 Sec. 31,NW	40.00 69.92 155.50 155.50 318.15 153.04

County	Legal Description	Acres
Wayne	St. Stephens Meridian	
	T. 10 N., R. 8 W., Sec. 35, LOT 6	16.00
Wilkinson	Washington Meridian	
	T. 2 N., R. 4 W., Sec. 33, FRL Sec.	2.50
	T. 3 N., R. 1 E., Sec. 14, SENE	40.00
Yalobusha	Choctaw Meridian	
	T. 24 N., R. 6 E., Sec.15, W2NW	80.74

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APPENDIX C—RELEVANT STATUTES, REGULATIONS, ORDERS, AND GUIDELINES

The following list is representative of applicable statutes, regulations, orders, and guidelines applicable to the Bureau of Land Management (BLM) Resource Management Plant (RMP) and Environmental Impact Statement (EIS) process. This list is not meant to be all inclusive.

LAW

- Federal Land Policy and Management Act of 1976 (FLPMA), as amended, 43 U.S.C 1701 et. seq., provides authority for BLM land use planning. Regulatory guidance is at 43 CFR 1600 et seq. The RMP process is in 43 CFR 1610.4.
- National Environmental Policy Act of 1969 (NEPA), as amended, 42 U.S.C. 4321 et seq. Bureau guidance on NEPA process is in the Bureau Manual 1790 and Manual Handbook H-1790-1. Other guidance is the, “Overview of BLM’s NEPA Process” from Course #1620-02, and Council on Environmental Quality’s “40 NEPA Questions,” March 16, 1981.
- Endangered Species Act (ESA) of 1973, as amended, 16 U.S.C. 1531 et seq.
- Antiquities Act of 1906, as amended, 16, U.S.C 431-433
- National Historic Preservation Act (NHPA), as amended, 16 U.S.C. 470 et seq.
- American Indian Religious Freedom Act (AIRFA) of 1978, as amended, 42 U.S.C. 1996 et seq.
- Recreation and Public Purposes Act (R&PP) of 1926, as amended, 43 U.S.C. 869 et seq.
- Federal Coal Leasing Amendments Act of 1976, as amended, 30 U.S.C. 201(a)(3)(A)(i).
- Surface Mining Control and Reclamation Act of 1977, 30 U.S.C. 1201 et seq.
- Mineral Leasing Act of 1920, as amended, 30 U.S.C. 181 et seq.
- Mineral Leasing Act of 1942 (for acquired lands)
- Onshore Oil and Gas Leasing Reform Act of 1987, 30 U.S.C. 181 et seq.
- General Mining Law of 1872, as amended, 30 U.S.C. 21 et seq.
- Mining and Mineral Policy At of 1970, as amended, 30 U.S.C. 21(a)
- Archeological Resources Protection Act (ARPA) of 1978, as amended, 42 U.S.C 1996 et seq.
- Migratory Bird Conservation Act of 1979, as amended, 16 U.S.C 715 et seq.
- Native American Graves Protection and Repatriation Act (NAGPRA) of 1990, as amended, 25 U.S.C 3001 et seq.
- Energy Policy and Conservation Act Reauthorization of 2000, as amended, P.L. 106-469. Energy Policy Act of 2005
- Clean Air Act of 1963, as amended
- Coastal Zone Management Act of 1972
- Clean Water Act of 1987, as amended
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980
- Resource Conservation and Recovery Act of 1976
- Color of Title Act of 1928
- Recreation and Public Purposes Act of 1926
- Federal Water Pollution Control Act of 1948
- National Ambient Air Quality Standards of 1990

EXECUTIVE AND SECRETARIAL ORDERS

- Executive Order 12898 (Environmental Justice in Minority and Low-Income Populations)
- Executive Order 13007 (Indian Sacred Sites)

- Executive Order 13084 (Consultation and Coordination with Indian Tribal Governments)
- Executive Order 13112 (Invasive Species)
- Executive Order 11988 (Floodplain Management)
- Executive Order 11990 (Protection of Wetlands)
- Secretarial Order 3175 (Incorporated into Departmental Manual at 512 DM 2)
- Secretarial Order 3206 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act)
- Executive Order 13186 (Migratory Birds)
- Executive Order 11514 (Protection and Enhancement of Environmental Quality)
- Executive Order 11738 (Administration of the Clean Air Act and the Federal Water Pollution Control Act with Respect to Federal Contracts, Grants, or Loans)
- Executive Order 12088 (Federal Compliance with Pollution Control Standards)

DEPARTMENT OF THE INTERIOR MANUAL

- DM 516 National Environmental Policy Act Revised Implementing Procedures, Published March 8, 2004 (Volume 69, Number 45) [Page 10865-10887].

BLM MANUAL AND HANDBOOK GUIDANCE

- Planning guidance for implementing Federal Land Policy and Management Act of 1976 is in BLM Manual Sections 1601 & 1613 and Manual Handbooks H-1601 and H-1624-1. BLM planning regulations are located at 43 CFR 1600. Appendix C of H-1601-1 contains program and resource-specific guidance for analysis and decisions.
- National Environmental Policy Act. The Council on Environmental Quality’s (CEQ) NEPA regulations is located at 40 CFR. 1500-1508. Bureau guidance on NEPA is in Manual 1790 and Manual Handbook H-1790-1. Other useful guidance is the Course Book, “Overview of BLM’s NEPA Process” from course #1620-02 and the CEQ’s “40 NEPA Questions,” March 16, 1981.
- BLM Manual 6480 – Consultation requirements and consideration of Endangered and Special Status Species in the land use planning process.
- BLM Manual 8120 & 8160 and BLM Handbook -8160-1 – Cultural Resources and Native American Consultation Guidance for Land Use Planning.
- BLM Manual 8300 and BLM Handbook H-8410-1 – Planning Guidance Related to Recreation Activities.
- BLM Manuals 6500 and 6720 – Consideration of Wildlife and Fisheries Management.
- BLM H-1553-1 – Publication Standards Manual Handbook

INFORMATION BULLETINS (IB) AND INSTRUCTION MEMORANDA (IM)

- Washington Office IB No. 2002-056 – Guidance on the “recommended Formats for Land Use Plans, Records of Decision, and Their Supporting Environmental Impact Statements.”
- Washington Office IB-2003-058 – Basic guidance on initial steps in the land use planning process
- Washington Office IB-2003-074 – Sampling Filing Plan for land use plan records.
- Washington Office IB-2003-020 – Scoping Report Format Report guidance.
- Washington Office IB-2002-101 – Additional guidance on Cultural Resources Consideration in Planning.
- Washington Office IM-2002-164 – Guidance on Environmental Justice in Planning.

- Washington Office IM-2002-167 and Manual Handbook H-1601-1, Appendix D – Additional guidance on the treatment of Socioeconomic issues in Land Use Plans.
- Washington Office IM-2003-137 – Additional guidance on integrating the Energy Policy Conservation Act inventories into Land Use Planning.
- Washington Office IM-2002-100 – The Bureau's procedures for internal review of preliminary documents.
- Washington Office IM-2003-025 – Bureau Printing Standards.
- Washington Office IM-2002-080 – Guidance on Comment Content Analysis.
- Washington Office IM-2003-070 – BLM Land Use Plan Protest Procedures.
- Washington Office IM-2002-202 – E-government Considerations.
- Washington Office IM-2002-203 and IM-2002-149 – Cooperating Agencies in Land Use Planning.
- Washington Office IM-2001-202 – Interim Guidance for Data Management in Land Use Planning.

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APPENDIX D—PROPOSED CONSERVATION MEASURES AND BEST MANAGEMENT PRACTICES

INTRODUCTION

This appendix describes conservation measures to reduce adverse affects caused by surface-disturbing or disruptive activities that are proposed under the action alternatives (Alternatives 2, 3, and 4). The information contained in this appendix would not apply to Alternative 1 (No Action). Most measures are specifically designed to protect sensitive wildlife species and habitats. While these measures are presented primarily as lease stipulations and Best Management Practices for oil and gas operations, they would also be applied to other actions permitted or undertaken by BLM.

ALTERNATIVE 3 (PREFERRED ALTERNATIVE) AND ALTERNATIVE 4

Proposed Stipulations

Three types of lease stipulations would be applied, defined as follows:

- No Surface Occupancy (NSO) – A constraint that prohibits occupancy or disturbance on all or part of a lease surface to protect special values or uses. Lessees may exploit the fluid mineral resources under the lease surface through use of directional drilling from outside of the NSO area.
- Controlled Surface Use (CSU) – A constraint under which use and occupancy is allowed (unless restricted by another stipulation), but identified resource values require special operational limitations that may modify lease rights.
- Seasonal (Timing Limitation) – A constraint that prohibits surface use during specified time periods to protect identified resource values.

For each stipulation there are provisions for waiver, modification and exception. A waiver is a permanent exemption to the stipulation. A modification is a change to the provisions of the stipulation either temporarily or for the term of the lease. An exception is a one-time exemption to the stipulations determined on a case-by-case basis. For Federally-listed species, waiver, modification and exception will normally require coordination and possible formal consultation with the USFWS.

Bald eagle

Stipulation (NSO): No surface occupancy or disturbance will be permitted within a 1,500-foot buffer zone around active or inactive bald eagle nests and communal roost sites (primary zone).

> **Objective:** To avoid impact to nesting eagles, including important courtship and nesting behavior, egg laying and incubation, and feeding and fledging activity.
>
> **Exception:** An exception may be granted if the operator agrees to implement measures developed in consultation with USFWS and appropriate state agencies.
>
> **Modification:** This stipulation may be modified to remain consistent with federal or state guidelines, or if a portion of the stipulated area is no longer within the 1,500-foot buffer zone.

> **Waiver:** This stipulation may be waived if no suitable nest sites are within 1,500 feet of any portion of the leased tract, or if the nest site has not been used for at least 5 years.

Stipulation (Controlled Surface Use): BLM permitted projects will not remove trees suitable for nesting within a 1.5 mile buffer zone around active or inactive bald eagle nests and communal roost sites (secondary zone).

> **Objective:** To protect foraging habitat, promote nest fidelity, and maintain habitat integrity around bald eagle nests and communal roosting sites.
>
> **Exception:** An exception may be granted if the operator agrees to implement measures developed in consultation with USFWS and in coordination with state agencies.
>
> **Modification:** This stipulation may be modified to remain consistent with federal and state guidelines, or if a portion of the stipulated area is no longer be within the 1.5 mile buffer zone.
>
> **Waiver:** This stipulation may be waived if no nest or communal roosting site can be identified within 1.5 miles of the leased tract, or if the applicant can document that the no sites have been used by bald eagles for five consecutive years.

Stipulation (Timing): Surface-disturbing and other activities that are potentially disruptive to nesting bald eagles are prohibited within 1.5 miles from a bald eagle nest or communal roosting site between December 1 and August 1.

> **Objective:** To protect foraging habitat, promote nest fidelity, and maintain habitat integrity around bald eagle nest and roosting sites.
>
> **Exception:** An exception may be granted if the operator agrees to implement measures developed in consultation with USFWS and in coordination with state agencies.
>
> **Modification:** This stipulation may be modified to remain consistent with federal and state guidelines, or if a portion of the stipulated area is no longer within the 1.5 mile buffer zone.
>
> **Waiver:** This stipulation may be waived if no nest site can be identified within 1.5 miles of any portion of the leased tract, or if the applicant can document that the no sites have been used by bald eagles for five consecutive years.

Red-cockaded woodpecker

Stipulation (NSO): No surface occupancy or disturbance within one-half mile of a red-cockaded woodpecker cluster, defined as the area containing all active and inactive cavity trees, plus a 200-foot buffer zone surrounding that area. Vehicle use is prohibited within a cluster except for through-travel on existing, maintained, paved roads.

> **Objective:** To protect red-cockaded woodpecker nest sites from disturbance and habitat degradation.
>
> **Exception:** An exception may be granted to allow surface occupancy within one-half mile of a cluster if the operator agrees to measures developed in consultation with USFWS and in coordination with state agencies.

Modification: This stipulation may be modified if a portion of the stipulated area no longer within the one-half mile buffer zone.

Waiver: This stipulation may be waived if no cluster can be identified within one-half mile of the leased tract.

Sea Turtles

(Green sea turtle, Hawksbill sea turtle, Kemp's Ridley sea turtle, Leatherback sea turtle, and Loggerhead sea turtle)

Stipulation (NSO): No surface occupancy or disturbance is permitted in suitable sea turtle nesting habitat.

Objective: To protect sea turtle nesting habitat.

Exception: An exception may be granted if the operator agrees to implement measures developed in consultation with USFWS and coordination with state agencies.

Modification: This stipulation may be modified if a portion of the stipulated area is no longer suitable sea turtle nesting habitat.

Waiver: This stipulation may be waived if it is determined that none of the leased area is suitable sea turtle nesting habitat.

Gopher tortoise, eastern indigo snake, and black pine snake

Stipulation (Controlled Surface Use): BLM-approved surveys will be required in all suitable gopher tortoise habitat where the tortoise is listed, including: Choctaw, Washington, Sumter, and Mobile counties in Alabama; and Clarke, Covington, Forrest, George, Greene, Hancock, Harrison, Jackson, Jones, Lamar, Marion, Pearl River, Perry, Stone, Walthall, and Wayne Counties in Mississippi. No surface disturbance or activity is permitted within 600 feet of a gopher tortoise burrow.

Suitable habitat includes areas with deep, well-drained sandy soils, especially the following USDA-NRCS soil series and 10% or more open pine forests (historically longleaf pine) or savannas with an open understory with grass and forb groundcover open areas. Suitable soils include Alaga, Bigbee, Eustis, Lakeland, Waldley or Troup, McLaurin, Benndale, Heidel, Bama, Smithdale, Ruston, Lucedale, Lucy, Shuguta, Baxterville, Malbis, Poarch, Saucier, Susquehanna, Boswell, Lorman, Freestone, Freest, Prentis, Savannah, Basin, and Petal.

Objective: To protect gopher tortoise habitat.

Exception: Exceptions may be granted if the proponent agrees to implement measures developed in consultation with USFWS and coordination with state agencies.

Modification: This stipulation may be modified if suitable gopher tortoise habitat does not exist on the stipulated area and that area does not provide forage habitat for adjacent tortoise populations. Survey requirements may be modified if current tortoise surveys of the tract are approved by BLM and USFWS.

Waiver: This stipulation may be waived if suitable gopher tortoise habitat does not exist on the tract and the tract does not provide forage habitat for gopher tortoises in adjacent areas.

Alabama beach mouse

Stipulation (NSO): No surface occupancy or disturbance will be permitted within suitable Alabama beach mouse habitat or its federally designated critical habitat.

Objective: To avoid impacts to Alabama beach mouse suitable habitat and designated critical habitat.

Exception: An exception may be granted if measures are developed and implemented in consultation with USFWS to avoid potential take of the species. These measures must also be coordinated with state agencies.

Modification: This stipulation may be modified if a portion of the stipulated area is found to no longer be suitable Alabama beach mouse habitat.

Waiver: This stipulation may be waived if it is determined that none of the leased area is suitable Alabama beach mouse habitat.

Gray bat, Indiana bat, Alabama cave shrimp and Alabama cave fish

Stipulation (NSO): No surface occupancy or disturbance permitted within 250 feet of caves, fractures, large sinkholes, and perennial or intermittent streams in or adjacent to counties with documented gray or Indiana bat populations.

Objective: To prevent any impact to hydrologic networks connected to cave habitats and to protect flight paths and food sources for the bat.

Exception: An exception may be granted if the operator agrees to implement measures developed in coordination with USFWS and appropriate state agencies. Formal consultation with USFWS may be required if determined necessary to protect species and associated habitat.

Modification: This stipulation may be modified if a portion of the stipulated area is found to no longer be within the buffer zone.

Waiver: This stipulation may be waived if no portion of the leased area is within the 250 foot buffer zone.

Stipulation (NSO): No surface occupancy or disturbance is permitted within 0.5 miles of an Indiana or gray bat summer roost or gray bat wintering cave hibernacula.

Objective: To prevent fatal disturbance during summer nursery roosting or winter hibernation.

Exception: An exception may be granted if the operator agrees to implement measures developed in coordination with USFWS and appropriate state agencies. Formal consultation with USFWS may be required if determined necessary to protect species and associated habitat.

Modification: This stipulation may be modified if the project does not adversely affect Indiana or gray bat hibernacula with concurrence from Fish and Wildlife Service and the appropriate state agencies.

Waiver: This stipulation may be waived if the lease is not within 0.5 miles of an Indiana or gray bat hibernacula.

Stipulation (Controlled Surface Use): Within 1.5 miles of an Indiana or gray bat hibernacula a BLM permitted action will not remove shagbark hickory trees or snags.

Objective: To prevent fatal disturbance during summer nursery roosting or winter hibernation.

Exception: An exception may be granted if the operator agrees to implement measures developed in coordination with USFWS and appropriate state agencies. Formal consultation with USFWS may be required if determined necessary to protect species and associated habitat.

Modification: None.

Waiver: None.

Stipulation (Controlled Surface Use): Injection or disposal of produced water or water withdrawal will not be allowed into identified karstic habitat or any hydrologic network connected to caves used by the bats or other listed cave species.

Objective: To prevent any impact to hydrologic networks connected to bat caves and flight paths, to protect food sources for the bat.

Exception: An exception may be granted if the operator agrees to implement measures developed in coordination with USFWS and appropriate state agencies. Formal consultation with USFWS may be required if determined necessary to protect species and associated habitat.

Modification: The stipulation may be modified if a portion of the stipulated area is not in karstic habitat or a hydrologic network connected to caves used by the bats.

Waiver: The stipulation may be waived if none of the lease area is karstic habitat or is not hydrologically connected to caves used by the bats.

Freshwater Aquatic Habitat

(Habitat for Special Status Species including: Alabama redbelly turtle, flattened musk turtle, yellow-blotched turtle, ringed map turtle, blue shiner Gulf sturgeon, slack water darter, Sensitive Clam and Snail Species: ovate clubshell, southern clubshell, fine-lined pocketbook, and Tolutoma Snail, and Wood Stork)

Stipulation (NSO): No surface occupancy or disturbance, including discharges, are permitted within 250 feet of a river, stream, wetland spring, headwaters, wet meadows, wet pine savannas, pond, tributary, lake, coastal slough, sand bars, vernal pools on granite outcrops, calcareous seepage marshes or small, marshy calcareous streams. If the slope exceeds 10%, the buffer may be extended up to 600 feet to provide adequate protection for aquatic habitats and associated species.

Objective: To protect water quality of watersheds and natural stream substrate and morphology and to avoid potential impacts to federal and state-listed aquatic species.

Exception: An exception may be granted if the operator agrees to 1) span creeks and floodplains by attaching pipelines to bridges or 2) directionally drill under creeks, rivers, and other waters supporting listed species, 3) implement other measures developed in consultation with USFWS and coordination with state agencies.

Modification: The buffer may be reduced if the adjacent waterway has been surveyed for 100 yards upstream and 300 yards downstream of the site, and results document the lack of suitable/occupied habitat for special status species within the mixing zone downstream of the project, as determined by BLM and USFWS.

Waiver: The stipulations may be waived if it is determined that the lease area has no hydrological connection to habitat of sensitive aquatic species.

Louisiana black bear

Stipulation: No surface disturbance, including removal of potential den trees, is permitted within a 1,500-foot buffer around den trees in occupied bottomland hardwood and floodplain forest habitats.

Objective: To protect Louisiana black bear denning and foraging habitat.

Exception: An exception may be granted if the operator agrees to implement measures developed in coordination with USFWS and appropriate state agencies.

Modification: Temporary surface use may be permitted if the USFWS concurs that the action would not adversely affect Louisiana black bear or suitable habitat.

Waiver: This stipulation may be waived if the tract does not contain suitable Louisiana black bear habitat.

Piping plover, least tern

Stipulation: No surface disturbance in piping plover and least tern habitat from the debris rack line to the low tide line of coastal beaches.

Objective: To protect wintering piping plover and least terns.

Exception: An exception may be granted if the operator agrees to implement measures which have been developed in consultation with the USFWS and in coordination with State agencies.

Modification: Temporary surface use may be permitted if the USFWS concurs that the action would not adversely affect piping plover or least tern or suitable habitat.

Waiver: This stipulation may be waived if the tract does not contain suitable piping plover or least tern habitat.

Sensitive Plant Species

(Including Alabama canebrake pitcher plant, green pitcher plant, Alabama leather flower, Eggert's sunflower, Kral's water plantain, Mohr's Barbara's buttons, Morefield's leather flower, Price's potato bean, and harperella)

Stipulation (Controlled Surface Use): All suitable special status plant species habitat will be identified during environmental review of any proposed surface use activity. If field examination indicates that habitat of one or more of these species is present, BLM will require a survey by a qualified botanist for special status plants during time periods appropriate to each species. Operations will not be allowed in areas where sensitive plants would be affected.

> **Objective:** To protect threatened, endangered, candidate, proposed, and BLM Sensitive Plant Species.
>
> **Exception:** An exception may be granted if the operator agrees to implement measures developed in consultation with USFWS and coordination with state agencies.
>
> **Modification:** The stipulation may be modified if it is determined that a portion of the lease area does not support sensitive plant species.
>
> **Waiver:** The stipulation may be waived if it is determined that the lease area does not support sensitive plant species.

Hancock County Marshes

Stipulation (NSO): No surface occupancy will be permitted within the component of the Mississippi Coastal Preserve System (MCPS) designated as Hancock County Marshes.

> **Objective:** To promote the preservation marshes habitat the preserve, including the following ecological communities expected or known to occur: estuarine subtidal, 1) large tidal creek; estuarine intertidal, 1) sand shore 2) mesohaline marsh 3) oligohaline marsh; and other shell middens.
>
> **Objective:** For the protection of coastal marshes within this state-designated preserve.
>
> **Exception:** An exception may be allowed if, in consultation with the State agency responsible for the MCPS, it is determined that potential affects of the proposal would be adequately mitigated.
>
> **Modification:** The stipulation may be modified if a portion of the leased area is no longer identified as part of the MCPS.
>
> **Waiver:** The stipulation may be waived if the leased area is no longer identified as part of the MCPS.

BEST MANAGEMENT PRACTICES

Best Management Practices (BMPs) are mitigation measures applied on a site-specific basis to reduce, prevent, or avoid adverse impacts. They may be incorporated as designs features when actions are proposed or may be attached as conditions of approval for BLM permitted actions Applications for Permit to Drill (APDs) for oil and gas.

The BMPs described below will be considered mandatory in Alternatives B and C, and will be applied to oil and gas operations on new and existing leases. Note that the objective of each BMP is to reduce adverse impacts to specific resources, and that there is some flexibility in implementation. The degree of flexibility will vary. Application of BMPs where there is potential to affect Federally listed, proposed or candidate species or designated critical habitat will normally require coordination and possible formal consultation with the USFWS. Examples of national environmental BMPs are listed below, and other BMPs that could be applied during site specific evaluation can be found in the *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development*, *Gold Book* (BLM 2006) and at http://www.blm.gov/bmp.

- Interim reclamation of the well and access road.
- Painting of all facilities to blend into the background.
- Design and construct all new roads to a safe and appropriate standard, “no higher than necessary” to accommodate intended vehicular use.
- Final reclamation of all disturbed areas, including access roads, to the original or similar contour.
- Raptor perch avoidance devices on powerlines.
- Burial of powerlines and flow lines in or immediately adjacent to the access roads.
- Centralized production facilities.
- The use of submersible pumps where feasible.
- Below ground wellheads where feasible.
- Multiple wells from a single well pad where feasible.
- Noise reduction techniques to reduce noise from compressors or other motorized equipment.
- Seasonal restrictions on public vehicular access where there are wildlife conflict or road damage/maintenance issues.
- Avoidance of production facilities on hilltops and ridgelines.

Disposal of Produced Water

Objective: To protect aquatic habitats for and to avoid potential impacts to special status fish, mussels, turtles, snails, plants, and migratory birds.

The preferred method for disposal of produced water will be disposed of through reinjection to a permeable formation with total dissolved solids (TDS) content higher than 10,000 mg/L* where the aquifer is not hydrologically connected to caves, wetlands, or surface water. If reinjection is not practicable, closed-containment treatment systems should be used to contain and treat produced water for those contaminants and for sediments exceeding State standards or EPA criteria. Salt content of any surface ponds for produced water, pigging pits, or other fluids must be less than 7500 µS/cm*. If surface pond salt content is greater than 7500 µS/cm or other bird toxicity is present or surface exhibits sheen, the ponds must be netted, covered with floating balls, or other methods used to exclude migratory birds

Produced waters may be released into an impounded reservoir if there is documentation that the discharge site and affected waters do not support special status species, are not designated critical habitat, and State and Federal water quality standards/criteria are met.

Produced waters may be released into a stream/river, if the discharge site and affected waters have been recently surveyed and lacks special status species, or the applicant conducts approved surveys documenting the absence of special status species and State and Federal water quality standards/criteria are met. Applicant should be aware that some species can only be surveyed during certain times of year.

Produced waters may be released into a stream/river if the applicant can document that the produced waters would not adversely affect special status species. Water quality tests would be conducted on stream segment(s) or other locations proposed as discharge points, volumes to be released, and any settling ponds or other treatments proposed to improve wastewater quality. The water quality test data, any monitoring proposed, and other available information on general CBM effluent characteristics (from published or unpublished literature) shall be reviewed by the Fish and Wildlife Service. Information on timing of the releases in relation to low water and other planned BMPs would also be required. Testing would include analysis of the discharge site and affected waters for COD, conductivity, TSS, As, Hg, Se, and PAHs. Dissolved oxygen and ammonia standards/criteria must be met in bottom waters if they support listed benthic or epibenthic species. If a special status species has been documented to be more sensitive than State/Federal standards/criteria, site-specific standards for that species may be imposed. Calculations would be based on State standards (or Federal CCC criteria for protection of freshwater aquatic life when the State has not determined a standard for these parameters).

Invasive and Non-Native Species

Objective: To discourage the spread of invasive, non-native plants.

Use of native and/or non-invasive cover plants in seeding mixtures will be encouraged to stabilize disturbed areas and during restoration activities. In the case of split-estate land final seed mixtures will be formulated in consultation with the private landowner.

Migratory Birds and Federally Listed Wildlife

Objective: To protect perch and roosting sites and terrestrial habitats for and to avoid potential impacts to migratory birds and federally listed wildlife.

Any reserve pit not closed within 10 days after a well is completed and which contains water must be netted, covered with floating balls, or use other methods to exclude migratory birds.

Maximum design speed on all operator-constructed and maintained (non-public) roads shall not exceed 25 miles per hour to minimize the chance of a collision with migratory birds or other listed wildlife species.

All power lines would be built to protect raptors and other migratory birds, including bald eagles, from accidental electrocution using methods detailed by the Avian Power Line Interaction Committee (1996)*.

* Avian Power Line Interaction Committee (APLIC). 1996. *Suggested Practices for Raptor Protection on Power Lines - The State of the Art in 1996*. Edison Electric Institute and the Raptor

Research Foundation. Washington, D.C.

Perching and Nesting Birds and Bats

Objective: To prevent birds and bats from entering or nesting in or on open vent stack equipment.

Open vent stack equipment, such as heater-treaters, separators, and dehydrator units, will be designed and constructed to prevent birds and bats from entering or nesting in or on such units, and to the extent practical, to discourage birds from perching on the stacks. Installing cone-shaped mesh covers on all open vents is one suggested method. Flat mesh covers are not expected to discourage perching and will not be acceptable.

Pesticide Application

Objective: To protect the water quality of watersheds and natural stream substrate and morphology supporting special status species and their host species.

Any ground application of herbicides or other pesticides, sterilants, or adjuvants within 150’ of listed species or habitat, will require site specific control measures developed in coordination or formal consultation with the USFWS. No aerial application of herbicides or pesticides will be permitted.

ALTERNATIVE 2

The lease stipulations and BMPs implemented under Alternative 2 would be the same as those discussed above for Alternatives 3 and 4, except for the following:

Alabama Beach Mouse: Suitable Alabama beach mouse habitat or its federally designated critical habitat would be unavailable for lease.

Freshwater Aquatic Habitat: No surface occupancy or disturbance, including discharges, are permitted within 1,000 feet of a river, stream, wetland spring, headwaters, wet meadows, wet pine savannas, pond, tributary, lake, coastal slough, sand bars, vernal pools on granite outcrops, calcareous seepage marshes or small, marshy calcareous streams.

> **Objective:** To protect water quality of watersheds and natural stream substrate and morphology and to avoid potential impacts to federal and state-listed aquatic species.
>
> **Exception:** An exception may be granted if the operator agrees to 1) span creeks and floodplains by attaching pipelines to bridges or 2) directionally drill under creeks, rivers, and other waters supporting listed species, 3) implement other measures developed in consultation with USFWS and coordination with state agencies.
>
> **Modification:** The buffer may be reduced if the adjacent waterway has been surveyed for 100 yards upstream and 300 yards downstream of the site, and results document the lack of suitable/occupied habitat for special status species within the mixing zone downstream of the project, as determined by BLM and USFWS.
>
> **Waiver:** The stipulations may be waived if it is determined that the lease area has no hydrological connection to habitat of sensitive aquatic species.

APPENDIX E—SPECIAL STATUS SPECIES IN ALABAMA AND MISSISSIPPI

This appendix provides information on special status species in the States of Alabama and Mississippi.

E.1. FEDERALLY PROTECTED SPECIES

The U.S. Fish and Wildlife Service provided species lists for Alabama and Mississippi. These lists are presented in the following sections.

E.1.1. Federally Protected Species In Alabama

There are 130 Federally protected species in Alabama as of October 27, 2005. Species in the following sections are coded as follows:

- E Endangered
- T Threatened
- EXPN Experimental Population, Non-essential
- SC Species of Concern
- S/A Similarity of Appearance
- PE Proposed Endangered
- PT Proposed Threatened
- C Candidate Taxon, Ready for Proposal
- **CH** Designated Critical Habitat
- **CH*** Indicates Critical Habitat in AL

E.1.1.1. Mammals

E ....Bat, gray (*Myotis grisescens*)
E-**CH**......Bat, Indiana (*Myotis sodalis*)
E in MS ..Bear, Louisiana black (*Ursus americanus luteolus*) S. AL bears are FL subspecies
E.............Manatee, Florida (*Trichechus manatus*) listed in FL, GA
E-**CH***....Mouse, Alabama beach (*Peromyscus polionotus ammobates*)
E-**CH***....Mouse, Perdido Key beach (*Peromyscus polionotus trissyllepsis*)

E.1.1.2. Birds

E.............Crane, Mississippi sandhill (*Grus canadensis pulla*) listed in MS
EXPN.....Crane, Whooping (*Grus americana*)
T.............Eagle, bald (*Haliaeetus leucocephalus*)
E in MS ..Pelican, brown (*Pelecanus occidentalis*) delisted 1985 in AL, FL, Atlantic Coast
T-**CH***....Plover, piping (*Charadrius melodus*)
E.............Stork, wood (*Mycteria americana*)
E.............Tern, least (*Sterna antillarum*) listed in MS and TN
E.............Woodpecker, red-cockaded (*Picoides borealis*)

E.1.1.3. Reptiles

T............Sea turtle, green (*Chelonia mydas*)
E............Sea turtle, hawksbill (*Eretmochelys imbricata*)
E............Sea turtle, Kemp's (=Atlantic) ridley (*Lepidochelys kempii*)
E............Sea turtle, leatherback (*Dermochelys coriacea*)
T............Sea turtle, loggerhead (*Caretta caretta*)
T............Snake, eastern indigo (*Drymarchon corais couperi*)
C............Snake, black pine (*Pituophis melanoleucus lodingi*)
T............Tortoise, gopher (*Gopherus polyphemus*) listed in Choctaw, Washington, Mobile counties only
E............Turtle, Alabama redbelly (*Pseudemys alabamensis*)
T............Turtle, flattened musk (*Sternotherus depressus*)
T............Turtle, ringed map (=sawback) (*Graptemys oculifera*) listed in MS
T............Turtle, yellow-blotched map (=sawback) (*Graptemys flavimaculata*) listed in MS

E.1.1.4. Amphibians

PE..........Gopher Frog, Dusky (*Rana sevosa*) MS only (*Rana capito*) in AL not listed
T............Salamander, Red Hills (*Phaeognathus hubrichti*)
T............Salamander, Flatwoods (*Phaeognathus cingulatum*) not seen for decades
C............Waterdog, Black Warrior (*Necturus alabamensis*)

E.1.1.5. Snails

T............Elimia (snail), lacy (*Elimia crenatella*)
E............Lioplax (snail), cylindrical (*Lioplax cyclostomaformis*)
E............Pebblesnail, flat (*Lepyrium showalteri*)
E............Riversnail, Anthony's (*Athearnia anthonyi*) NEP below Wilson Dam
T............Rocksnail, painted (*Leptoxis taeniata*)
E............Rocksnail, plicate (*Leptoxis plicata*)
T............Rocksnail, round (*Leptoxis ampla*)
E............Snail, tulotoma (=Alabama live-bearing) (*Tulotoma magnifica*)
E............Armored snail (*Marstonia [=Pyrgulopsis] pachyta*)
E............Slender campeloma (*Campeloma decampi*)

E.1.1.6. Mussels

E-**CH***....Acornshell, southern (*Epioblasma othcaloogensis*) **probably extirpated**
C............Bean, Choctaw (*Villosa choctawensis*)
E............Blossom, turgid (pearlymussel) (*Epioblasma turgidula*) **probably extinct**
E............Blossom, yellow (pearlymussel) (*Epioblasma florentina florentina*) **probably extirpated**
E............Catspaw (*Epioblasma obliquata obliquata*) **probably extirpated**
E............Clubshell, black (=Curtus' mussel) (*Pleurobema curtum*) **probably extirpated**
E-**CH***....Clubshell, ovate (*Pleurobema perovatum*)
E-**CH***....Clubshell, southern (*Pleurobema decisum*)
E-**CH***....Combshell, Cumberlandian (*Epioblasma brevidens*) CH in Bear Creek
E............Combshell, southern (=penitent mussel) (*Epioblasma penita*)
E-**CH***....Combshell, upland (*Epioblasma metastriata*) **probably extirpated**
E............Fanshell (*Cyprogenia stegaria*)
T............Heelsplitter, Alabama (=inflated) (*Potamilus inflatus*)

E-**CH***.... Kidneyshell, triangular (*Ptychobranchus greenii*) may be split into 2 species, watch for details
C............ Kidneyshell, Southern (*Ptychobranchus jonesi*)
E............ Lampmussel, Alabama (*Lampsilis virescens*)
E............ Lilliput, pale (pearlymussel) (*Toxolasma cylindrellus*)
T-**CH***.... Moccasinshell, Alabama (*Medionidus acutissimus*)
E-**CH***.... Moccasinshell, Coosa (*Medionidus parvulus*)
E............ Moccasinshell, Gulf (*Medionidus penicillatus*)
E............ Monkeyface, Cumberland (pearlymussel) (*Quadrula intermedia*)
T-**CH***.... Mucket, orange-nacre (*Hamiota [Lampsilis] perovalis*)
E............ Mucket, pink (pearlymussel) (*Lampsilis abrupta*)
E-**CH***.... Oyster Mussel (*Epioblasma capsaeformis*) NEP in AL below Wilson Dam, CH in Bear Creek
C............ Pearlshell, Alabama (*Margaritifera marrianae*)
E............ Pearlymussel, cracking (*Hemistena lata*)
E............ Pearlymussel, dromedary (*Dromus dromas*) **probably extirpated**
E............ Pearlymussel, littlewing (*Pegias fabula*) **probably extirpated**
C............ Pearlymussel, slabside (*Pleuronaia [Lexingtonia] dolabelloides*)
E-**CH***.... Pigtoe, dark (*Pleurobema furvum*)
E............ Pigtoe, fine-rayed (*Fusconaia cuneolus*)
E............ Pigtoe, flat (=Marshall's mussel) (*Pleurobema marshalli*) **probably extirpated**
C............ Pigtoe, fuzzy (*Pleurobema strodeanum*)
E............ Pigtoe, oval (*Pleurobema pyriforme*)
E............ Pigtoe, heavy (=Judge Tait's mussel) (*Pleurobema taitianum*)
E............ Pigtoe, rough (*Pleurobema plenum*)
E............ Pigtoe, shiny (*Fusconaia cor [=edgariana]*)
E-**CH***.... Pigtoe, southern (*Pleurobema georgianum*)
E............ Pimpleback, orangefoot (pearlymussel) (*Plethobasus cooperianus*)
E............ Pink, ring (mussel) (*Obovaria retusa*)
T-**CH***.... Pocketbook, finelined (*Hamiota [=Lampsilis] altilis*)
E............ Pocketbook, shinyrayed (*Hamiota [Lampsilis] subangulata*)
T............ Purple Bankclimber (*Plectomerus [=Elliptoideus] sloatianus*)
C............ Sandshell, southern (*Lampsilis australis*)
E............ Stirrupshell (*Quadrula stapes*) **probably extinct**
E............ Wartyback, white (*pearlymussel*) (*Plethobasus cicatricosus*)

E.1.1.7. Crustaceans

E............ Shrimp, Alabama cave (*Palaemonias alabamae*)

E.1.1.8. Fish

E-**CH***.... Cavefish, Alabama (*Speoplatyrhinus poulsoni*)
T-**CH**...... Chub, spotfin (*Erimonax monachus*)*;* (= *Cyprinella [=Hybopsis] monacha*)
E............ Darter, boulder (=Elk River) (*Etheostoma wapiti*)
T............ Darter, goldline (*Percina aurolineata*)
C............ Darter, Rush (*Etheostoma phytophylum*)
E............ Darter, Vermilion (*Etheostoma chermocki*)
T-**CH***.... Darter, slackwater (*Etheostoma boschungi*) CH in Cypress Creek & tributaries
T............ Darter, snail (*Percina tanasi*)
E............ Darter, watercress (*Etheostoma nuchale*)
T............ Sculpin, pygmy (*Cottus pygmaeus*)
T............ Shiner, blue (*Cyprinella [=Notropis] caerulea*)

E ....Shiner, Cahaba (*Notropis cahabae*)
E ....Shiner, Palezone (*Notropis albizonatus*)
E ....Sturgeon, Alabama (*Scaphirhyncus suttkusi*)
T-**CH***....Sturgeon, Gulf (*Acipenser oxyrinchus desotoi*)

E.1.1.9. Plants

T ....Little amphianthus (*Amphianthus pusillus*)
T ....Price's potato-bean (*Apios priceana*)
T ....Braun's rock cress (*Arabis perstellata*) no records in Daphne AL GIS
E ....Morefield's leather-flower (*Clematis morefieldii*)
E ....Alabama leather-flower (*Clematis socialis*)
E ....Leafy prairie-clover (*Dalea [=Petalostemum] foliosa*)
C ....Whorled sunflower (*Helianthus verticillatus*)
T ....Lyrate bladderpod (*Lesquerella lyrata*)
C ....Panhandle lily (*Lilium iridollae*)
E ....Pondberry (*Lindera melissifolia*) not known in AL when listed throughout range
T ....Mohr's Barbara's buttons (*Marshallia mohrii*)
C ....White fringless orchid (*Platanthera integrilabia*)
E ....Harperella (*Ptilimnium nodosum [=fluviatile]*)
T ....Kral's water-plantain (*Sagittaria secundifolia*) = Little River Arrowhead
E ....Green pitcher-plant (*Sarracenia oreophila*)
E ....Alabama canebrake pitcher-plant (*Sarracenia rubra ssp. alabamensis*)
E ....American chaffseed (*Schwalbea americana*)
E ....Gentian pinkroot (*Spigelia gentianoides*) *var. alabamensis* in Bibb Cty not protected by ESA
E ....Relict trillium (*Trillium reliquum*)
E ....Tennessee yellow-eyed grass (*Xyris tennesseensis*)
C ....Georgia Rockcress (*Arabis georgiana*)
C ....Georgia aster (*Aster georgiana*)
C ....Fleshyfruit gladecress (*Leavenworthia crassa*) see TVAGIS dataset

E.1.1.10. Ferns and Allies

T ....American hart's-tongue fern (*Asplenium scolopendrium var. americanum*)
E ....Louisiana quillwort (*Isoetes louisianensis*)
T ....Alabama streak-sorus fern (*Thelypteris pilosa var. alabamensis*)

E.1.1.11. Insects

E ....Butterfly, Mitchell's Satyr (*Neonympha mitchellii mitchellii*) AL not in listed range but found here
E ....Hine's Emerald Dragonfly (*Sematochlora hineana*) recorded once'78, no surveys since

E.1.2. Federally Protected Species List for Mississippi

There are 37 Federally protected species in Mississippi as of December 2000. This list does not include the five endangered whale species that may occasionally be found in Mississippi coastal waters. Species in the following sections are coded as follows:

- E Endangered
- T Threatened

In addition, these species are exceptions to those listed in the following sections:

- **Protected Species due to Similarity of Appearance** (look similar to federally listed species):
  - American Alligator
  - American Black Bear
- **Extirpated Species** (Once lived in Mississippi but are no longer found here):
  - Alabama Sturgeon
  - American Burying Beetle
  - Bachman's Warbler
  - Florida Panther
  - Ivory-billed Woodpecker
  - Red Wolf
- **Extinct Species** (Gone forever from Mississippi and the world):
  - Carolina Parakeet
  - Passenger Pigeon
- **Recovered Species** (Populations increased so that the species is no longer in danger of going extinct and has been removed from the Endangered Species List):
  - Peregrine Falcon, August 1995

E.1.2.1. Mammals

E .... Bat, gray (*Myotis grisescens*)
E .... Bat, Indiana (*Myotis sodalis*)
T .... Bear, Louisiana Black (*Ursus americanus luteolus*)
E .... Manatee, West Indian (*Trichechus manatus*)

E.1.2.2. Birds

E .... Crane, Mississippi Sandhill (*Grus canadensis pulla*)
T .... Eagle, Bald (*Haliaeetus leucocephalus*), proposed for delisting 2001
E .... Pelican, Brown (*Pelecanus occidentalis*)
T .... Plover, Piping (*Charadrius melodus*)
E .... Tern, Least (interior population) (*Sterna antillarum*)
E .... Woodpecker, Red-cockaded (*Picoides borealis*)

E.1.2.3. Reptiles

T .... Sea Turtle, Green (*Chelonia mydas*)
E .... Sea Turtle, Hawksbill (*Eretmochelys imbricata*)
E .... Sea Turtle, Kemp's Ridley (=Atlantic) (*Lepidochelys kempii*)
E .... Sea Turtle, Leatherback (*Dermochelys coriacea*)
T .... Sea Turtle, Loggerhead (*Caretta caretta*)
T .... Snake, Eastern Indigo (*Drymarchon corais couperi*)
T .... Turtle, Ringed Map (=sawback) (*Graptemys oculifera*)
T .... Turtle, Yellow-blotched (=sawback) (*Graptemys flavimaculatata*)
T .... Tortoise, Gopher (*Gopherus polyphemus*)

E.1.2.4. Fish

T .... Darter, Bayou (*Etheostoma rubrum*)

T ....Sturgeon, Gulf (*Acipenser oxyrinchus desotoi*)
E ....Sturgeon, Pallid (*Scaphirhynchus albus*)

E.1.2.5. Mussels

E ....Clubshell, Black (*Pleurobema curtum*)
E ....Clubshell, Ovate (*Pleurobema perovatum*)
E ....Clubshell, Southern (*Pleurobema decisum*)
E ....Combshell, Southern (*Epioblasma penita*)
T ....Heelsplitter, Inflated (*Potamilus inflatus*)
T ....Moccasinshell, Alabama (*Medionidus acutissimus*)
T ....Mucket, Orange-nacre (*Lampsilis perovalis*)
E ....Pigtoe, flat (*Pleurobema marshalli*)
E ....Pigtoe, heavy (*Pleurobema taitianum*)
E ....Pocketbook, Fat (*Potamilus [=Proptera] caprax*)
E ....Stirrupshell (*Quadrula stapes*)

E.1.2.6. Plants

E ....American Chaffseed (*Schwalbea americana*)
E ....Louisiana Quillwort (*Isoetes louisianensis*)
T ....Price's Potato-bean (*Apios priceana*)
E ....Pondberry (*Lindera melissifolia*)

E.1.3. Federally Protected Species in Alabama By County

There following sections present the occurrence of Federally protected species in Alabama by county. However, bald eagles (*Haliaeetus leucocephalus*), red-cockaded woodpeckers (*Picoides borealis*) and American peregrine falcons (*Falco peregrinus anatum*) may occur in any county, if suitable habitat exists. Species in the following sections are coded as follows:

- E Endangered Species
- T Threatened Species
- C Candidate Species
- CH Critical Habitat Designated
- (P) Historical Record and/or Possible Occurrence in County
- PE Proposed Endangered
- PT Proposed Threatened

E.1.3.1. Autauga

T ....Bald eagle (*Haliaeetus leucocephalus*)
E ....Wood stork (*Mycteria americana*)
E ....Alabama sturgeon (*Scaphirhynchus suttkusi*)
E ....Alabama canebrake pitcher plant (*Sarracenia rubra ssp.alabamensis*)
T ....Price's potato bean (*Apios priceana*)

E.1.3.2. Baldwin

E ....West Indian manatee (*Trichechus manatus*)
ECH ....Alabama beach mouse (*Peromyscus polionotus ammobates*)

ECH ....Perdido Key beach mouse (*Peromyscus polionotus trissylepsis*)
C.............Bachman’s sparrow (*Aimophila aestivalis*)
E.............Red-cockaded woodpecker (*Picoides borealis*)
E.............Least tern (*Sterna antillarum*)
TPCH .....Piping plover (*Charadrius melodus*)
T.............Bald eagle (*Haliaeetus leucocephalus*)
E.............Wood stork (*Mycteria americana*)
T.............Eastern indigo snake (*Drymarchon corais couperi*) (P)
E.............Alabama red-bellied turtle (*Pseudemys alabamensis*)
T.............Loggerhead sea turtle (*Caretta caretta*)
E.............Kemp’s ridley sea turtle (*Lepidochelys kempii*)
T.............Green sea turtle (*Chelonia mydas*) (P)
T.............Flatwoods salamander (*Ambystoma cingulatum*) (P)
E.............Heavy pigtoe mussel (*Pleurobema taitianum*)
T.............Inflated heelsplitter mussel (*Potamilus inflatus*)
T.............Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
E.............Alabama sturgeon (*Scaphirhynchus suttkusi*)
E.............American chaffseed (*Schwalbea americana*)
C.............Panhandle lily (*Lillium iridollae*)

E.1.3.3. Barbour

E.............Wood stork (*Mycteria americana*)
T.............Bald Eagle (*Haliaeetus leucocephalus*)

E.1.3.4. Bibb

E.............Red-cockaded woodpecker (*Picoides borealis*)
E.............Cylindrical lioplax snail (*Lioplax cyclostomaformis*)
E.............Flat pebblesnail (*Lepyrium showalteri*)
T.............Round rocksnail (*Leptoxis ampla*)
T.............Orange-nacre mucket mussel (*Lampsilis perovalis*)
T.............Fine-lined pocketbook mussel (*Lampsilis altilis*)
E.............Triangular kidneyshell mussel (*Ptychobranchus greenii*)
E.............Cahaba shiner (*Notropis cahabae*)
T.............Goldline darter (*Percina aurolineata*)
T.............Mohr’s Barbara’s buttons (*Marshallia mohrii*)
E.............Tennessee yellow-eyed grass (*Xyris tennesseensis*)
C.............Georgia rockcress (*Arabis georgiana*)
E.............Mitchell’s satyr butterfly (*Neonympha mitchellii mitchellii*)

E.1.3.5. Blount

T.............Flattened musk turtle (*Sternotherus depressus*)
C.............Black Warrior waterdog (*Necturus alabamensis*)
E.............Plicate rocksnail (*Leptoxis plicata*)
E.............Triangular kidneyshell mussel (*Ptychobranchus greenii*)
T.............Fine-lined pocketbook mussel (*Lampsilis altilis*)
T.............Orange-nacre mucket mussel (*Lampsilis perovalis*)
E.............Ovate clubshell mussel (*Pleurobema perovatum*)
E.............Cahaba shiner (*Notropis cahabae*)

T ....Eggert’s sunflower (*Helianthus eggertii*)
C ....Georgia aster (*Aster georgianus*)

E.1.3.6. Bullock

E ....Red cockaded woodpecker (*Picoides borealis*)
E ....Relict trillium (*Trillium reliquum*)

E.1.3.7. Butler

E ....Wood stork (*Mycteria americana*)
T ....Red hills salamander (*Phaeognathus hubrichti*)

E.1.3.8. Calhoun

E ....Gray bat (*Myotis grisescens*)
E ....Red-cockaded woodpecker (*Picoides borealis*)
E ....Tulotoma snail (*Tulotoma magnifica*)
T ....Painted rocksnail (*Leptoxis taeniata*)
T ....Fine-lined pocketbook mussel (*Lampsilis altilis*)
E ....Southern pigtoe mussel (*Pleurobema georgianum*)
E ....Triangular kidneyshell mussel (*Ptychobranchus greenii*)
E ....Southern clubshell mussel (*Pleurobema decisum*)
E ....Tennessee yellow-eyed grass (*Xyris tennesseensis*)
T ....Mohr’s Barbara’s buttons (*Marshallia mohrii*)
C ....White fringeless orchid (*Platanthera integrilabia*)

E.1.3.9. Chambers

T ....Little amphianthus (*Amphianthus pusillus*)

E.1.3.10. Cherokee

T ....Bald eagle (*Haliaeetus leucocephalus*)
E ....Coosa moccasinshell mussel (*Medionidus parvulus*)
E ....Triangular kidneyshell mussel (*Ptychobranchus greenii*)
T ....Fine-lined pocketbook mussel (*Lampsilis altilis*)
E ....Ovate clubshell mussel (*Pleurobema perovatum*)
E ....Southern clubshell mussel (*Pleurobema decisum*)
T ....Blue shiner (*Cyprinella caerulea*)
E ....Green pitcher plant (*Sarracenia oreophila*)
E ....Harperella (*Ptilimnium nodosum*)
T ....Mohr’s Barbara’s buttons (*Marshallia mohrii*)
E ....Alabama leather flower (*Clematis socialis*)
T ....Kral’s water-plantain (*Sagittaria secundifolia*)
C ....Whorled sunflower (*Helianthus verticillatus*)

E.1.3.11. Chilton

T ....Bald eagle (*Haliaeetus leucocephalus*)
E ....Red-cockaded woodpecker (*Picoides borealis*)

E.............Wood stork (*Mycteria americana*)
T.............Painted rocksnail (*Leptoxis taeniata*)
E.............Alabama canebrake pitcher plant (*Sarracenia rubra ssp.alabamensis*)

E.1.3.12. Choctaw

T.............Bald eagle (*Haliaeetus leucocephalus*)
E.............Wood stork (*Mycteria americana*)
T.............Gopher tortoise (*Gopherus polyphemus*)
T.............Inflated heelsplitter mussel (*Potamilus inflatus*)
T.............Gulf sturgeon (*Acipenser oxyrinchus desotoi*)

E.1.3.13. Clarke

E.............Wood stork (*Mycteria americana*)
C.............Black pine snake (*Pituophis melanoleucus lodingi*)
T.............Inflated heelsplitter mussel (*Potamilus inflatus*)
E.............Heavy pigtoe mussel (*Pleurobema taitianum*) (P)
T.............Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
E.............Alabama sturgeon (*Scaphirhynchus suttkusi*)

E.1.3.14. Clay

E.............Tulotoma snail (*Tulotoma magnifica*)
E.............Southern pigtoe mussel (*Pleurobema georgianum*)
T.............Fine-lined pocketbook mussel (*Lampsilis altilis*)
T.............Blue shiner (*Cyprinella caerulea*)
C.............Georgia aster (*Aster georgianus*)
C.............White fringeless orchid (*Platanthera integrilabia*)

E.1.3.15. Cleburne

E.............Red-cockaded woodpecker (*Picoides borealis*)
E.............Southern pigtoe mussel (*Pleurobema georgianum*)
E.............Southern clubshell mussel (*Pleurobema decisum*)
E.............Triangular kidneyshell mussel (*Ptychobranchus greenii*)
T.............Fine-lined pocketbook (*Lampsilis altilis*)
C.............White fringeless orchid (*Platanthera integrilabia*)

E.1.3.16. Coffee

E.............Wood stork (*Mycteria americana*)
T.............Gulf sturgeon (*Acipenser oxyrinchus desotoi*)

E.1.3.17. Colbert

E.............Gray bat (*Myotis grisescens*)
E.............Indiana bat (*Myotis sodalis*) (P)
E.............Anthony’s riversnail (*Athearnia anthonyi*)
E.............Pink mucket pearly mussel (*Lampsilis abrupta*)
E.............White warty-back pearly mussel (*Plethobasus cicatricosus*)

E.............Rough pigtoe pearly mussel (*Pleurobema plenum*)
E.............Cumberlandian combshell mussel (*Epioblasma brevidens*)
E.............Ring pink mussel (*Obovaria retusa*)
E.............Turgid blossom pearlymussel (*Epioblasma turgidula*)
E.............Cracking pearlymussel (*Hemistena lata*)
C.............Slabside pearlymussel (*Lexingtonia dolabelloides*)
E.............Fanshell mussel (*Cyprogenia stegaria*)
E.............Alabama cave shrimp (*Palaemonias alabamae*)
E.............Spotfin chub (*Cyprinella* (*=Hybopsis*) *monacha*)
T.............Lyrate bladder-pod (*Lesquerella lyrata*)
T.............Eggert's sunflower (*Helianthus eggertii*) (P)
E.............Leafy prairie-clover (*Dalea foliosa*)

E.1.3.18. Conecuh

E.............Gray bat (*Myotis grisescens*)
E.............Red-cockaded woodpecker (*Picoides borealis*)
T.............Red hills salamander (*Phaeognathus hubrichti*)
C.............Alabama pearlshell (*Margaritifera marrianae*)
T.............Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
E.............Louisiana quillwort (*Isoetes louisianensis*)

E.1.3.19. Coosa

E.............Red-cockaded woodpecker (*Picoides borealis*)
T.............Bald eagle (*Haliaeetus leucocephalus*)
E.............Tulotoma snail (*Tulotoma magnifica*)
T.............Fine-lined pocketbook mussel (*Lampsilis altilis*)
E.............Southern pigtoe mussel (*Pleurobema georgianum*)
T.............Blue shiner (*Cyprinella caerulea*)
T.............Kral's water-plantain (*Sagittaria secundifolia*)

E.1.3.20. Covington

E.............Red-cockaded woodpecker (*Picoides borealis*)
E.............Wood stork (*Mycteria americana*)
T.............Bald eagle (*Haliaeetus leucocephalus*)
T.............Eastern indigo snake (*Drymarchon corais couperi*) (P)
T.............Red hills salamander (*Phaeognathus hubrichti*)
T.............Flatwoods salamander (*Ambystoma cingulatum*) (P)
T.............Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
E.............Pondberry (*Lindera melissifolia*)
T.............Louisiana quillwort (*Isoetes louisianensis*) (P)

E.1.3.21. Crenshaw

E.............Wood stork (*Mycteria americana*)
T.............Red hills salamander (*Phaeognathus hubrichti*)

E.1.3.22. Cullman

T.............Flattened musk turtle (*Sternotherus depressus*)
C.............Black Warrior waterdog (*Necturus alabamensis*)
E.............Ovate clubshell mussel (*Pleurobema perovatum*)
E.............Triangular kidneyshell mussel (*Ptychobranchus greenii*)
T.............Fine-lined pocketbook mussel (*Lampsilis altilis*)

E.1.3.23. Dale

T.............Gulf sturgeon (*Acipenser oxyrinchus desotoi*)

E.1.3.24. Dallas

T.............Bald eagle (*Haliaeetus leucocephalus*)
E.............Wood stork (*Mycteria americana*)
E.............Red-cockaded woodpecker (*Picoides borealis*)
E.............Southern clubshell mussel (*Leurobema decisum*)
E.............Heavy pigtoe mussel (*Pleurobema taitianum*)
T.............Orange-nacre mucket mussel (*Lampsilis perovalis*)
T.............Fine-lined pocketbook mussel (*Lampsilis altilis*)
E.............Alabama sturgeon (*Scaphirhynchus suttkusi*)

E.1.3.25. DeKalb

E.............Gray bat (*Myotis grisescens*)
E.............Indiana bat (*Myotis sodalis*) (P)
T.............Fine-lined pocketbook mussel (*Lampsilis altilis*)
T.............Blue shiner (*Cyprinella caerulea*)
T.............Kral’s water-plantain (*Sagittaria secundifolia*)
E.............Green pitcher plant (*Sarracenia oreophila*)
E.............Harperella (*Ptilimnium nodosum*)
T.............Eggert’s sunflower (*Helianthus eggertii*) (P)

E.1.3.26. Elmore

T.............Bald eagle (*Haliaeetus leucocephalus*)
E.............Tulotoma snail (*Tulotoma magnifica*)
E.............Fine-lined pocketbook mussel (*Lampsilis altilis*)
E.............Alabama canebrake pitcher plant (*Sarracenia rubra ssp.alabamensis*)
C.............Georgia rockcress (*Arabis georgiana*)

E.1.3.27. Escambia

E.............Wood stork (*Mycteria americana*)
E.............Red-cockaded woodpecker (*Picoides borealis*)
T.............Gulf sturgeon (*Acipenser oxyrinchus desotoi*)

E.1.3.28. Etowah

T.............Flattened musk turtle (*Sternotherus depressus*)

E.............Southern clubshell mussel (*Pleurobema decisum*)
T.............Fine-lined pocketbook mussel (*Lampsilis altilis*)
E.............Triangular kidneyshell mussel (*Ptychobranchus greenii*)
E.............Southern pigtoe mussel (*Pleurobema georgianum*)
E.............Ovate clubshell mussel (*Pleurobema perovatum*)
C.............Rush darter (*Etheostoma phytophilum*)
T.............Mohr’s Barbara’s buttons (*Marshallia mohrii*)
E.............Green pitcher plant (*Sarracenia oreophila*)
E.............Alabama leather flower (*Clematis socialis*)

E.1.3.29. Fayette

T.............Orange-nacre mucket mussel (*Lampsilis perovalis*)
E.............Dark pigtoe mussel (*Pleurobema furvum*)
T.............Fine-lined pocketbook mussel (*Lampsilis altilis*)

E.1.3.30. Franklin

E.............Gray bat (*Myotis grisescens*)
C.............Slabside pearlymussel (*Lexingtonia dolabelloides*)
E.............Cumberlandian combshell mussel (*Epioblasma brevidens*)
T.............Lyrate bladder-pod (*Lesquerella lyrata*)
E.............Leafy prairie clover (*Dalea foliosa*)
E.............Tennessee yellow-eyed grass (*Xyris tennesseensis*)
T.............Eggert’s sunflower (*Helianthus eggertii*)

E.1.3.31. Geneva

E.............Red-cockaded woodpecker (*Picoides borealis*)
T.............Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
E.............Gentian pinkroot (*Spigelia gentianoides var. gentianoides*)

E.1.3.32. Greene

E.............Wood stork (*Mycteria americana*)
T.............Orange-nacre mucket mussel (*Lampsilis perovalis*)
T.............Alabama moccasinshell mussel (*Medionidus acutissimus*)
E.............Southern clubshell mussel (*Pleurobema decisum*)
E.............Ovate clubshell mussel (*Pleurobema perovatum*)
E.............Heavy pigtoe mussel (*Pleurobema taitianum*)
T.............Inflated heelsplitter mussel (*Potamilus inflatus*)
E.............Stirrup shell mussel (*Quadrula stapes*)
E.............Mitchell’s satyr butterfly (*Neonympha mitchellii mitchellii*)

E.1.3.33. Hale

E.............Red-cockaded woodpecker (*Picoides borealis*)
T.............Bald eagle (*Haliaeetus leucocephalus*)
E.............Wood stork (*Mycteria americana*)
T.............Inflated heelsplitter mussel (*Potamilus inflatus*)

E.1.3.34. Henry

T............Bald eagle (*Haliaeetus leucocephalus*)
E............Wood stork (*Mycteria americana*)
E............Relict trillium (*Trillium reliquum*)

E.1.3.35. Houston

T............Bald eagle (*Haliaeetus leucocephalus*)
T............Flatwoods salamander (*Ambystoma cingulatum*) (P)
E............Gulf moccasinshell mussel (*Medionidus penicillatus*)
E............Oval pigtoe mussel (*Pleurobema pyriforme*)

E.1.3.36. Jackson

E............Gray bat (*Myotis grisescens*)
E............Indiana bat (*Myotis sodalis*)
T............Bald eagle (*Haliaeetus leucocephalus*)
E............Anthony’s riversnail (*Athearnia anthonyi*)
E............Shiny pigtoe pearly mussel (*Fusconaia cor [edgariana*])
E............Pink mucket pearly mussel (*Lampsilis abrupta*)
E............Alabama lamp pearly mussel (*Lampsilis virescens*)
E............Pale lilliput pearly mussel (*Toxolasma cylindrellus*)
E............Fine-rayed pigtoe mussel (*Fusconaia cuneolus*)
C............Slabside pearlymussel (*Lexingtonia dolabelloides*)
E............Palezone shiner (*Notropis albizonatus*)
E............Green pitcher plant (*Sarracenia oreophila*)
T............American hart’s-tongue fern (*Phyllitis scolopendrium var.americana*)
T............Eggert’s sunflower (*Helianthus eggertii*) (P)
T............Price’s potato-bean (*Apios priceana*)
C............White fringeless orchid (*Platanthera integrilabia*)
E............Hine’s emerald dragonfly (*Somatochlora hineana*) (P)

E.1.3.37. Jefferson

T............Flattened musk turtle (*Sternotherus depressus*)
C............Black Warrior waterdog (*Necturus alabamensis*)
E............Plicate rocksnail (*Leptoxis plicata*)
E............Upland combshell mussel (*Epioblasma metastriata*)
T............Fine-lined pocketbook mussel (*Lampsilis altilis*)
E............Triangular kidneyshell mussel (*Ptychobranchus greenii*)
T............Orange-nacre mucket mussel (*Lampsilis perovalis*)
E............Watercress darter (*Etheostoma nuchale*)
E............Cahaba shiner (*Notropis cahabae*)
T............Goldline darter (*Percina aurolineata*)
C............Rush darter (*Etheostoma phytophilum*)
PE..........Vermilion darter (*Etheostoma chermocki*)
E............Leafy prairie-clover (*Dalea foliosa*)

E.1.3.38. Lamar

E............Southern combshell mussel (*Epioblasma penita*)
E............Southern clubshell mussel (*Pleurobema decisum*)
E............Ovate clubshell mussel (*Pleurobema perovatum*)
T............Orange-nacre mucket mussel (*Lampsilis perovalis*)
T............Alabama moccasinshell mussel (*Medionidus acutissimus*)

E.1.3.39. Lauderdale

E............Gray bat (*Myotis grisescens*)
E............Indiana bat (*Myotis sodalis*) (P)
T............Bald eagle (*Haliaeetus leucocephalus*)
E............Anthony's riversnail (*Athearnia anthonyi*)
E............Ring pink mussel (*Obovaria retusa*)
E............Turgid blossom pearlymussel (*Epioblasma turgidula*)
E............Cracking pearlymussel (*Hemistena lata*)
E............Pink mucket pearly mussel (*Lampsilis abrupta*)
E............White warty-back pearly mussel (*Plethobasus cicatricosus*)
E............Rough pigtoe pearly mussel (*Pleurobema plenum*)
E............Fanshell (*Cyprogenia stegaria*)
TCH ....Slackwater darter (*Etheostoma boschungi*)
ECH ....Alabama cavefish (*Speoplatyrhinus poulsoni*)
E............Spotfin chub (*Cyprinella [=Hybopsis] monacha*)
T............Eggert's sunflower (*Helianthus eggertii*) (P)
C............Fleshyfruit gladecress (*Leavenworthia crassa*)
C............Georgia rockcress (*Arabis georgiana*)

E.1.3.40. Lawrence

E............Gray bat (*Myotis grisescens*)
E............Indiana bat (*Myotis sodalis*)
E............Red-cockaded woodpecker (*Picoides borealis*)
T............Bald eagle (*Haliaeetus leucocephalus*)
E............Pink mucket pearly mussel (*Lampsilis abrupta*)
T............Alabama moccasinshell mussel (*Medionidus acutissimus*)
T............Fine-lined pocketbook mussel (*Lampsilis altilis*)
T............Orange-nacre mucket mussel (*Lampsilis perovalis*)
E............Dark pigtoe mussel (*Pleurobema furvum*)
E............Triangular kidneyshell mussel (*Ptychobranchus greenii*)
E............Rough pigtoe mussel (*Pleurobema plenum*)
E............Leafy prairie clover (*Dalea foliosa*)
T............Lyrate bladder-pod (*Lesquerella lyrata*)
T............Eggert's sunflower (*Helianthus eggertii*) (P)
C............Fleshyfruit gladecress (*Leavenworthia crassa*)

E.1.3.41. Lee

E............Ovate clubshell mussel (*Pleurobema perovatum*)
T............Purple bankclimber (*Eliptoideus sloatianus*)
E............Southern clubshell mussel (*Pleurobema decisum*)

T.............Fine-lined pocketbook mussel (*Lampsilis altilis*)
E.............Relict trillium (*Trillium reliquum*)

E.1.3.42. Limestone

E.............Gray bat (*Myotis grisescens*)
E.............Indiana bat (*Myotis sodalis*) (P)
E.............Anthony’s riversnail (*Athearnia anthonyi*)
E.............Slender campeloma snail (*Campeloma decampi*)
E.............Armored snail (*Pyrgulopsis pachyta*)
E.............Pink mucket pearly mussel (*Lampsilis abrupta*)
E.............Rough pigtoe mussel (*Pleurobema plenum*)
E.............Cumberland monkeyface mussel (*Quadrula intermedia*)
E.............Cracking pearlymussel (*Hemistena lata*)
E.............Ring pink mussel (*Obovaria retusa*)
T.............Slackwater darter (*Etheostoma boschungi*)
E.............Boulder darter (*Etheostoma wapiti*)
T.............Eggert’s sunflower (*Helianthus eggertii*) (P)

E.1.3.43. Lowndes

E.............Wood stork (*Mycteria americana*)
T.............Bald eagle (*Haliaeetus leucocephalus*)
E.............Alabama sturgeon (*Scaphirhynchus suttkusi*)

E.1.3.44. Macon

E.............Red-cockaded woodpecker (*Picoides borealis*)
E.............Wood stork (*Mycteria americana*)
E.............Southern clubshell mussel (*Pleurobema decisum*)
E.............Ovate clubshell mussel (*Pleurobema perovatum*)
T.............Fine-lined pocketbook mussel (*Lampsilis altilis*)

E.1.3.45. Madison

E.............Gray bat (*Myotis grisescens*)
E.............Slender campeloma snail (*Campeloma decampi*)
E.............Pink mucket pearly mussel (*Lampsilis abrupta*)
E.............Shiny pigtoe pearly mussel (*Fusconaia cor [edgariana]*)
E.............Fine-rayed pigtoe mussel (*Fusconaia cuneolus*)
E.............Rough pigtoe mussel (*Pleurobema plenum*)
C.............Slabside pearlymussel (*Lexingtonia dolabelloides*)
E.............Alabama cave shrimp (*Palaemonias alabamae*)
T.............Slackwater darter (*Etheostoma boschungi*)
E.............Snail darter (*Percina tanasi*)
T.............Price’s potato bean (*Apios priceana*)
E.............Morefield’s leather flower (*Clematis morefieldii*)
T.............Eggert’s sunflower (*Helianthus eggertii*) (P)

E.1.3.46. Marengo

T............Bald eagle (*Haliaeetus leucocephalus*)
T............Inflated heelsplitter mussel (*Potamilus inflatus*)

E.1.3.47. Marion

T............Orange-nacre mucket mussel (*Lampsilis perovalis*)
E............Southern combshell mussel (*Epioblasma penita*)
C............White fringeless orchid (*Platanthera integrilabia*)

E.1.3.48. Marshall

E............Gray bat (*Myotis grisescens*)
E............Indiana bat (*Myotis sodalis*)
E............Red-cockaded woodpecker (*Picoides borealis*)
T............Bald eagle (*Haliaeetus leucocephalus*)
T............Flattened musk turtle (*Sternotherus depressus*)
E............Pink mucket pearly mussel (*Lampsilis abrupta*)
E............Shiny pigtoe pearly mussel (*Fusconaia cor [edgariana*])
E............Fine-rayed pigtoe mussel (*Fusconaia cuneolus*)
E............Orange-footed pimpleback mussel (*Plethobasus cooperianus*)
C............Slabside pearlymussel (*Lexingtonia dolabelloides*)
E............Rough pigtoe mussel (*Pleurobema plenum*)
E............Snail darter (*Percina tanasi*)
T............Price’s potato bean (*Apios priceana*)
E............Green pitcher plant (*Sarracenia oreophila*)
T............Eggert’s sunflower (*Helianthus eggertii*) (P)

E.1.3.49. Mobile

E............West Indian manatee (*Trichechus manatus*)
T............Piping plover (*Charadrius melodus*)
E............Red-cockaded woodpecker (*Picoides borealis*)
E............Least tern (*Sterna antillarum*)
T............Bald eagle (*Haliaeetus leucocephalus*)
T............Eastern indigo snake (*Drymarchon corais couperi*)
C............Black pine snake (*Pituophis melanoleucus lodingi*)
T............Gopher tortoise (*Gopherus polyphemus*)
E............Alabama red-bellied turtle (*Pseudemys alabamensis*)
T............Loggerhead sea turtle (*Caretta caretta*)
E............Kemp’s Ridley sea turtle (*Lepidochelys kempii*) (P)
T............Green sea turtle (*Chelonia mydas*) (P)
T............Flatwoods salamander (*Ambystoma cingulatum*) (P)
T............Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
E............Louisiana quillwort (*Isoetes louisianensis*) (P)

E.1.3.50. Monroe

E............Gray bat (*Myotis grisescens*)
T............Red hills salamander (*Phaeognathus hubrichti*)

E............Heavy pigtoe mussel (*Pleurobema taitianum*)
C............Alabama pearlshell (*Margaritifera marrianae*)
T............Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
E............Alabama sturgeon (*Scaphirhynchus suttkusi*)
E............Louisiana quillwort (*Isoetes louisianensis*)

E.1.3.51. Montgomery

E............Wood stork (*Mycteria americana*)
T............Bald eagle (*Haliaeetus leucocephalus*)

E.1.3.52. Morgan

E............Gray bat (*Myotis grisescens*)
E............Indiana bat (*Myotis sodalis*)
E............Pink mucket pearly mussel (*Lampsilis abrupta*)
E............Ring pink mussel (*Obovaria retusa*)
E............Rough pigtoe mussel (*Pleurobema plenum*)
E............Leafy prairie-clover (*Dalea foliosa*)
T............American hart's-tongue fern (*Asplenium scolopendrium var.americana*)
T............Eggert's sunflower (*Helianthus eggertii*) (P)
C............Fleshyfruit gladecress (*Leavenworthia crassa*)

E.1.3.53. Perry

T............Bald eagle (*Haliaeetus leucocephalus*)
E............Red-cockaded woodpecker (*Picoides borealis*)
E............Ovate clubshell (*Pleurobema perovatum*)
E............Cahaba shiner (*Notropis cahabae*)

E.1.3.54. Pickens

E............Red-cockaded woodpecker (*Picoides borealis*)
T............Bald eagle (*Haliaeetus leucocephalus*)
T............Orange-nacre mucket mussel (*Lampsilis perovalis*)
T............Alabama moccasinshell mussel (*Medionidus acutissimus*)
E............Flat pigtoe (*Pleurobema marshallii*)
T............Inflated heelsplitter (*Potamilus inflatus*)
E............Southern clubshell mussel (*Pleurobema decisum*)
E............Ovate clubshell mussel (*Pleurobema perovatum*)
E............Heavy pigtoe mussel (*Pleurobema taitianum*)
E............Stirrup shell mussel (*Quadrula stapes*)

E.1.3.55. Pike

No listed species.

E.1.3.56. Randolph

T............Bald eagle (*Haliaeetus leucocephalus*)
T............Little amphianthus (*Amphianthus pusillus*)

E.1.3.57. Russell

E............Red-cockaded woodpecker (*Picoides borealis*)
E............Shiny-rayed pocketbook mussel (*Lampsilis subangulata*)
C............Georgia rockcress (*Arabis georgiana*)

E.1.3.58. Shelby

E............Gray bat (*Myotis grisescens*)
E............Indiana bat (*Myotis sodalist*)
T............Bald eagle (*Haliaeetus leucocephalus*
T............Painted rocksnail (*Leptoxis taeniata*)
E............Cylindrical lioplax (snail) (*Lioplax cyclostomaformis*)
E............Tulotoma snail (*Tulotoma magnifica*)
E............Flat pebblesnail (*Lepyrium showalteri*)
T............Round rocksnail (*Leptoxis ampla*)
E............Southern clubshell mussel (*Pleurobema decisum*)
E............Triangular kidneyshell mussel (*Ptychobranchus greenii*)
E............Southern acornshell mussel (*Epioblasma othcaloogensis*) (P)
T............Fine-lined pocketbook mussel (*Lampsilis altilis*)
T............Orange-nacre mucket mussel (*Lampsilis perovalis*)
T............Alabama moccasinshell mussel (*Medionidus acutissimus*)
E............Cahaba shiner (*Notropis cahabae*)
T............Goldline darter (*Percina aurolineata*)

E.1.3.59. St. Clair

E............Tulotoma snail (*Tulotoma magnifica*)
E............Southern acornshell mussel (*Epioblasma othcaloogensis*)
E............Triangular kidneyshell mussel (*Ptychobranchus greenii*)
E............Southern pigtoe mussel (*Pleurobema georgianum*)
T............Fine-lined pocketbook mussel (*Lampsilis altilis*)
E............Upland combshell mussel (*Epioblasma metastriata*)
E............Southern clubshell mussel (*Pleurobema decisum*)
E............Ovate clubshell (*Pleurobema perovatum*)
E............Alabama leather flower (*Clematis socialis*)

E.1.3.60. Sumter

E............Wood stork (*Mycteria americana*)
T............Bald eagle (*Haliaeetus leucocephalus*)
T............Gopher tortoise (*Gopherus polyphemus*)
E............Ovate clubshell mussel (*Pleurobema perovatum*)
T............Inflated heelsplitter mussel (*Potamilus inflatus*)
E............Stirrup shell mussel (*Quadrula stapes*)
E............Heavy pigtoe mussel (*Pleurobema taitianum*)

E.1.3.61. Talladega

E............Red-cockaded woodpecker (*Picoides borealis*)
E............Tulotoma snail (*Tulotoma magnifica*)

T.............Painted rocksnail (*Leptoxis taeniata*)
T.............Lacy elimia (snail) (*Elimia crenatella*)
T.............Fine-lined pocketbook mussel (*Lampsilis altilis*)
E.............Coosa moccasinshell mussel (*Medionidus parvulus*)
E.............Southern pigtoe mussel (*Pleurobema georgianum*)
E.............Southern clubshell (*Pleurobema decisum*)
E.............Triangular kidneyshell (*Ptychobranchus greenii*)

E.1.3.62. Tallapoosa

E.............Red-cockaded woodpecker (*Picoides borealis*)
T.............Bald eagle (*Haliaeetus leucocephalus*)
T.............Fine-lined pocketbook mussel (*Lampsilis altilis*)

E.1.3.63. Tuscaloosa

E.............Red-cockaded woodpecker (*Picoides borealis*)
E.............Wood stork (*Mycteria americana*)
T.............Bald eagle (*Haliaeetus leucocephalus*)
T.............Flattened musk turtle (*Sternotherus depressus*)
C.............Black Warrior waterdog (*Necturus alabamensis*)
E.............Southern clubshell mussel (*Pleurobema decisum*)
E.............Dark pigtoe mussel (*Pleurobema furvum*)
E.............Ovate clubshell mussel (*Pleurobema perovatum*)
T.............Alabama moccasinshell mussel (*Medionidus acutissimus*)
T.............Inflated heelsplitter mussel (*Potamilus inflatus*)
T.............Fine-lined pocketbook mussel (*Lampsilis altilis*)
T.............Orange-nacre mucket mussel (*Lampsilis perovalis*)
C.............White fringeless orchid (*Platanthera integrilabia*)
E.............Mitchell’s satyr butterfly (*Neonympha mitchellii mitchellii*)

E.1.3.64. Walker

T.............Flattened musk turtle (*Sternotherus depressus*)
C.............Black Warrior waterdog (*Necturus alabamensis*)
E.............Ovate clubshell mussel (*Pleurobema perovatum*)
E.............Triangular kidneyshell mussel (*Ptychobranchus greenii*)
T.............Fine-lined pocketbook mussel (*Lampsilis altilis*)
T.............Mohr’s Barbara’s buttons (*Marshallia mohrii*)

E.1.3.65. Washington

E.............Wood stork (*Mycteria americana*)
T.............Gopher tortoise (*Gopherus polyphemus*)
C.............Black pine snake (*Pituophis melanoleucus lodingi*)
T.............Inflated heelsplitter mussel (*Potamilus inflatus*)
T.............Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
E.............Louisiana quillwort (*Isoetes louisianensis*) (P)

E.1.3.66. Wilcox

T............Bald eagle (*Haliaeetus leucocephalus*)
E............Wood stork (*Mycteria americana*) (P)
C............Alabama pearlshell (*Margaritifera marrianae*)
E............Heavy pigtoe mussel (*Pleurobema taitianum*) (P)
T............Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
E............Alabama sturgeon (*Scaphirhynchus suttkusi*)
C............Georgia rockcress (*Arabis georgiana*)

E.1.3.67. Winston

E............Red-cockaded woodpecker (*Picoides borealis*)
T............Flattened musk turtle (*Sternotherus depressus*)
C............Black Warrior waterdog (*Necturus alabamensis*)
T............Orange-nacre mucket mussel (*Lampsilis perovalis*)
T............Alabama moccasinshell mussel (*Medionidus acutissimus*)
E............Coosa moccasinshell mussel (*Medionidus parvulus*)
E............Dark pigtoe mussel (*Pleurobema furvum*)
E............Triangular kidneyshell mussel (*Ptychobranchus greenii*)
T............Fine-lined pocketbook mussel (*Lampsilis altilis*)
E............Ovate clubshell mussel (*Pleurobema perovatum*)
C............Rush darter (*Etheostoma phytophilum*)
T............Kral’s water-plantain (*Sagittaria secundifolia*)
T............Alabama streak-sorus fern (*Thelypteris pilosa var. alabamensis*)
C............White fringeless orchid (*Platanthera integrilabia*)

E.1.4. Federally Protected Species in Mississippi By County

There following sections present the occurrence of Federally protected species in Alabama by county. However, Bald eagle is proposed to be delisted and Critical Habitat is proposed for Piping Plover on barrier islands and in certain areas of coastal counties. Species in the following sections are coded as follows:

- E Endangered Species
- T Threatened Species
- C Candidate Species
- CH Critical Habitat Designated
- (P) Historical Record and/or Possible Occurrence in County
- PE Proposed Endangered
- PT Proposed Threatened

E.1.4.1. Statewide

E............Fat pocketbook (*Potamilus capax*) has been found in the lower Mississippi River and may occur in side channels.

E.1.4.2. Adams

T............Louisiana black bear (*Ursus americanus luteolus*)
T............Bald eagle (*Haliaeetus leucocephalus*)

E.............Pallid sturgeon (*Scaphirhynchus albus*) (P)

E.1.4.3. Amite

T.............Louisiana black bear (*Ursus a. luteolus*)
E.............Red-cockaded woodpecker (*Picoides borealis*)

E.1.4.4. Attala

T.............Louisiana black bear (*Ursus a. luteolus*)

E.1.4.5. Bolivar

E.............Least tern (*Sterna antillarum*)
T.............Bald eagle (*Haliaeetus leucocephalus*)
E.............Pallid sturgeon (*Scaphirhynchus albus*) (P)
E.............Pondberry (*Lindera melissifolia*)

E.1.4.6. Chickasaw

T.............Price’s potato bean (*Apios priceana*) (P)

E.1.4.7. Claiborne

T.............Louisiana black bear (*Ursus a. luteolus*)
T.............Bayou darter (*Etheostoma rubrum*)
E.............Pallid sturgeon (*Scaphirhynchus albus*) (P)

E.1.4.8. Clarke

T.............Louisiana black bear (*Ursus a. luteolus*) (*P*)
T.............Yellow-blotched map turtle (*Graptemys flavimaculata*)

E.1.4.9. Clay

T.............Price’s potato bean (*Apios priceana*)

E.1.4.10. Coahoma

E.............Least tern (*Sterna antillarum*)
E.............Pallid sturgeon (*Scaphirhynchus albus*) (P)

E.1.4.11. Copiah

T.............Louisiana black bear (*Ursus a. luteolus*)
T.............Ringed map turtle (*Graptemys oculifera*)
T.............Bayou darter (*Etheostoma rubrum*)
T.............Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)

E.1.4.12. Covington

T .... Louisiana black bear (*Ursus a. luteolus*) (P)
T .... Gopher tortoise (*Gopherus polyphemus*)

E.1.4.13. DeSoto

E .... Least tern (*Sterna antillarum*)
E .... Pallid sturgeon (*Scaphirhynchus albus*) (P)

E.1.4.14. Forrest

T .... Louisiana black bear (*Ursus a. luteolus*)
E .... Red-cockaded woodpecker (*Picoides borealis*)
T .... Gopher tortoise (*Gopherus polyphemus*)
T .... Yellow-blotched map turtle (*Graptemys flavimaculata*)
T .... Eastern indigo snake (*Drymarchon corais couperi*) (P)
C .... Black pine snake (*Pituophis melanoleucus ssp. lodingi*)
C .... Pearl darter (*Percina aurora*) Pascagoula River System
E .... Louisiana quillwort (*Isoetes louisianensis*)

E.1.4.15. Franklin

T .... Louisiana black bear (*Ursus a. luteolus*)
E .... Red-cockaded woodpecker (*Picoides borealis*)

E.1.4.16. George

T .... Louisiana black bear (*Ursus a. luteolus*)
E .... Red-cockaded woodpecker (*Picoides borealis*)
T .... Gopher tortoise (*Gopherus polyphemus*)
T .... Yellow-blotched map turtle (*Graptemys flavimaculata*)
T .... Eastern indigo snake (*Drymarchon corais couperi*) (P)
C .... Black pine snake (*Pituophis melanoleucus ssp. lodingi*)
C .... Pearl darter (*Percina aurora*) Pascagoula River System
T .... Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)
E .... Louisiana quillwort (*Isoetes louisianensis*) (P)

E.1.4.17. Greene

T .... Louisiana black bear (*Ursus a. luteolus*)
E .... Red-cockaded woodpecker (*Picoides borealis*)
T .... Gopher tortoise (*Gopherus polyphemus*)
T .... Yellow-blotched map turtle (*Graptemys flavimaculata*)
T .... Eastern indigo snake (*Drymarchon corais couperi*) (*P*)
T .... Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)
E .... Louisiana quillwort (*Isoetes louisianensis*)

E.1.4.18. Grenada

T .... Bald eagle (*Haliaeetus leucocephalus*)

E.1.4.19. Hancock

T............Louisiana black bear (*Ursus a. luteolus*)
E............Brown pelican (*Pelecanus occidentalis*)
T............Piping Plover (*Charadrius melodus*)
T............Bald eagle (*Haliaeetus leucocephalus*)
T............Gopher tortoise (*Gopherus polyphemus*)
E............Kemp's Ridley (*Lepidochelys kempii*)
T............Green turtle (*Chelonia mydas*) (P)
T............Loggerhead turtle (*Caretta caretta*)
T............Inflated heelsplitter (*Potamilus inflatus*)
T............Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)
E............Louisiana quillwort (*Isoetes louisianensis*) (*P*)

E.1.4.20. Harrison

T............Louisiana black bear (*Ursus a. luteolus*)
T............Bald eagle (*Haliaeetus leucocephalus*)
E............Brown pelican (*Pelecanus occidentalis*)
T............Gopher tortoise (*Gopherus polyphemus*)
T............Piping Plover (*Charadrius melodus*)
C............Black pine snake (*Pituophis melanoleucus ssp. lodingi*)
E............Kemp's Ridley (*Lepidochelys kempii*)
T............Green turtle (*Chelonia mydas*) (P)
T............Loggerhead turtle (*Caretta caretta*)
PE..........Mississippi gopher frog (proposal under review)
T............Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)
E............Louisiana quillwort (*Isoetes louisianensis*)

E.1.4.21. Hinds

T............Louisiana black bear (*Ursus a. luteolus*) (P)
T............Ringed map turtle (*Graptemys oculifera*)
T............Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)
T............Bayou darter (*Etheostoma rubrum*)

E.1.4.22. Holmes

T............Louisiana black bear (*Ursus a. luteolus*) (P)

E.1.4.23. Humphreys

T............Louisiana black bear (*Ursus a. luteolus*) (P)

E.1.4.24. Issaquena

T............Louisiana black bear (*Ursus a. luteolus*)
E............Least tern (*Sterna antillarum*)
E............Pallid sturgeon (*Scaphirhynchus albus*) (*P*)

E.1.4.25. Itawamba

T............Bald eagle (*Haliaeetus leucocephalus*)
E............Black clubshell (Curtus' mussel) (*Pleurobema curtum*)
E............Southern combshell (Penitent shell mussel) (*Epioblasma penita*)
E............Heavy Pigtoe (Judge Tait's mussel) (*Pleurobema taitianum*)
E............Southern clubshell (*Pleurobema decisum*)
T............Orange-nacre mucket (*Lampsilis perovalis*)
E............Ovate clubshell (*Pleurobema perovatum*)

E.1.4.26. Jackson

T............Louisiana black bear (*Ursus a. luteolus*)
E............Brown pelican (*Pelecanus occidentalis*)
E............Red-cockaded woodpecker (*Picoides borealis*)
E............Mississippi sandhill crane (*Grus canadensis pulla*) (CH)
T............Gopher tortoise (*Gopherus polyphemus*)
T............Yellow-blotched map turtle (*Graptemys flavimaculata*)
T............Eastern indigo snake (*Drymarchon corais couperi*) (P)
T............Piping Plover (*Charadrius melodus*)
T............Bald eagle (*Haliaeetus leucocephalus*)
E............Kemp's Ridley (*Lepidochelys kempii*)
T............Loggerhead turtle (*Caretta caretta*)
C............Pearl darter (*Percina aurora*) Pascagoula River System
T............Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)
E............Louisiana quillwort (*Isoetes louisianensis*)

E.1.4.27. Jasper

T............Louisiana black bear (*Ursus a. luteolus*) (P)
E............Red-cockaded woodpecker (*Picoides borealis*)

E.1.4.28. Jefferson

T............Louisiana black bear (*Ursus a. luteolus*)
E............Fat pocketbook mussel (*Potamilus capax*)
E............Pallid sturgeon (*Scaphirhynchus albus*) (P)

E.1.4.29. Jefferson Davis

T............Louisiana black bear (*Ursus a. luteolus*) (P)

E.1.4.30. Jones

T............Louisiana black bear (*Ursus a. luteolus*) (P)
E............Red-cockaded woodpecker (*Picoides borealis*)
C............Black pine snake (*Pituophis melanoleucus ssp. lodingi*)
T............Eastern indigo snake (*Drymarchon corais couperi*) (P)
T............Gopher tortoise (*Gopherus polyphemus*)
T............Yellow-blotched map turtle (*Graptemys flavimaculata*)
C............Pearl darter (*Percina aurora*) Pascagoula River System

E.............Louisiana quillwort (*Isoetes louisianensis*)

E.1.4.31. Kemper

T.............Price’s potato bean (*Apios priceana*)

E.1.5. Lafayette

T.............Bald eagle (*Haliaeetus leucocephalus*)

E.1.5.1. Lamar

T.............Louisiana black bear (*Ursus a. luteolus*) (P)
T.............Gopher tortoise (*Gopherus polyphemus*)

E.1.5.2. Lauderdale

T.............Louisiana black bear (*Ursus a. luteolus*) (P)
T.............Bald eagle (*Haliaeetus leucocephalus*)

E.1.5.3. Lawrence

T.............Louisiana black bear (*Ursus a. luteolus*)
T.............Ringed map turtle (*Graptemys oculifera*)
T.............Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)

E.1.5.4. Leake

T.............Louisiana black bear (*Ursus a. luteolus*) (P)
T.............Ringed map turtle (*Graptemys oculifera*)

E.1.5.5. Lee

T.............Price’s potato bean (*Apios priceana*)

E.1.5.6. Lowndes

E.............Heavy Pigtoe (Judge Tait’s mussel) (*Pleurobema taitianum*)
E.............Southern combshell (Penitent shell mussel) (*Pleurobema penita*)
T.............Louisiana black bear (*Ursus a. luteolus*)
T.............Alabama moccasinshell (*Medionidus acutissimus*)
E.............Southern clubshell (*Pleurobema decisum*)
T.............Orange-nacre mucket (*Lampsilis perovalis*)
T.............Ovate clubshell (*Pleurobema perovatum*)

E.1.5.7. Madison

T.............Louisiana black bear (*Ursus a. luteolus*) (P)
T.............Bald eagle (*Haliaeetus leucocephalus*)
T.............Ringed map turtle (*Graptemys oculifera*)

E.1.5.8. Marion

T............Louisiana black bear (*Ursus a. luteolus*)
T............Ringed map turtle (*Graptemys oculifera*)
T............Gopher tortoise (*Gopherus polyphemus*)
T............Eastern indigo snake (*Drymarchon corais couperi*)
C............Black pine snake (*Pituophis melanoleucus ssp. lodingi*)
T............Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)

E.1.5.9. Monroe

T............Bald eagle (*Haliaeetus leucocephalus*)
E............Black combshell (Curtus' mussel) (*Pleurobema curtum*)
E............Southern combshell (Penitent shell mussel) (*Epioblasma penita*)
E............Heavy Pigtoe (Judge Tait's mussel) (*Pleurobema taitianum*)
E............Southern clubshell (*Pleurobema decisum*)
T............Orange-nacre mucket (*Lampsilis perovalis*)
T............Alabama moccasinshell (*Medionidus acutissimus*)
E............Ovate clubshell (*Pleurobema perovatum*)

E.1.5.10. Neshoba

T............Louisiana black bear (*Ursus a. luteolus*) (P)
T............Ringed map turtle (*Graptemys oculifera*)

E.1.5.11. Newton

T............Louisiana black bear (*Ursus a. luteolus*) (P)

E.1.5.12. Noxubee

E............Red-cockaded woodpecker (*Picoides borealis*)
T............Bald eagle (*Haliaeetus leucocephalus*)

E.1.5.13. Oktibbeha

E............Red-cockaded woodpecker (*Picoides borealis*)
T............Bald eagle (*Haliaeetus leucocephalus*)
T............Price's potato bean (*Apios priceana*)

E.1.5.14. Panola

T............Bald eagle (*Haliaeetus leucocephalus*)

E.1.5.15. Pearl River

T............Louisiana black bear (*Ursus a. luteolus*)
C............Black pine snake (*Pituophis melanoleucus ssp. lodingi*)
T............Ringed map turtle (*Graptemys oculifera*)
T............Gopher tortoise (*Gopherus polyphemus*)
T............Inflated heelsplitter (*Potamilus inflatus*)

T.............Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)
E.............Louisiana quillwort (*Isoetes louisianensis*) (P)

E.1.5.16. Perry

T.............Louisiana black bear (*Ursus a. luteolus*)
E.............Gray bat (*Myotis grisescens*) (P)
E.............Red-cockaded woodpecker (*Picoides borealis*)
T.............Gopher tortoise (*Gopherus polyphemus*)
T.............Yellow-blotched map turtle (*Graptemys favimaculata*)
T.............Eastern indigo snake (*Drymarchon corais couperi*) (P)
C.............Black pine snake (*Pituophis melanoleucus ssp. lodingi*)
C.............Camp Shelby burrowing crayfish (*Fallicambarus gordoni*)
C.............Pearl darter (*Percina aurora*) Pascagoula River System
E.............Louisiana quillwort (*Isoetes louisianensis*)

E.1.5.17. Pike

T.............Louisiana black bear (*Ursus a. luteolus*) (P)

E.1.5.18. Rankin

T.............Louisiana black bear (*Ursus a. luteolus*) (P)
T.............Bald eagle (*Haliaeetus leucocephalus*)
T.............Ringed sawback turtle (*Graptemys oculifera*)
T.............Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)

E.1.5.19. Scott

T.............Louisiana black bear (*Ursus a. luteolus*) (*P*)
E.............Red-cockaded woodpecker (*Picoides borealis*)
T.............Ringed map turtle (*Graptemys oculifera*)

E.1.5.20. Sharkey

T.............Louisiana black bear (*Ursus a. luteolus*) (P)
E.............Pondberry (*Lindera melissifolia*)
E.............Pallid sturgeon (*Scaphirhynchus albus*)

E.1.5.21. Simpson

T.............Louisiana black bear (*Ursus a. luteolus*) (P)
T.............Ringed map turtle (*Graptemys oculiferi*)
T.............Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)

E.1.5.22. Smith

T.............Louisiana black bear (*Ursus a. luteolus*) (*P*)
E.............Red-cockaded woodpecker (*Picoides borealis*)

E.1.5.23. Stone

T .... Louisiana black bear (*Ursus a. luteolus*)
E .... Red-cockaded woodpecker (*Picoides borealis*)
C .... Black pine snake (*Pituophis melanoleucus ssp. lodingi*)
T .... Eastern indigo snake (*Drymarchon corais couperi*) (P)
T .... Gopher tortoise (*Gopherus polyphemus*)
T .... Yellow-blotched map turtle (*Graptemys flavimaculata*)
E .... Louisiana quillwort (*Isoetes louisianensis*)

E.1.5.24. Sunflower

T .... Bald eagle (*Haliaeetus leucocephalus*)
E .... Pondberry (*Lindera melissifolia*)

E.1.5.25. Tallahatchie

T .... Bald eagle (*Haliaeetus leucocephalus*)
E .... Pondberry (*Lindera melissifolia*)

E.1.5.26. Tate

T .... Bald eagle (*Haliaeetus leucocephalus*)

E.1.5.27. Tishomingo

E .... Gray bat (*Myotis grisescens*)
E .... Indiana bat (*Myotis sodalis*)
T .... Bald eagle (*Haliaeetus leucocephalus*)

E.1.5.28. Tunica

E .... Least tern (*Sterna antillarum*)
T .... Bald eagle (*Haliaeetus leucocephalus*)
E .... Pallid sturgeon (*Scaphirhynchus albus*) (P)

E.1.5.29. Walthall

T .... Louisiana black bear (*Ursus a. luteolus*) (P)

E.1.5.30. Warren

T .... Louisiana black bear (*Ursus a. luteolus*)
T .... Bald eagle (*Haliaeetus leucocephalus*)
E .... Least tern (*Sterna antillarum*)
E .... Pallid sturgeon (*Scaphirhynchus albus*) (P)

E.1.5.31. Washington

T .... Louisiana black bear (*Ursus a. luteolus*)
E .... Least tern (*Sterna antillarum*)

T.............Bald eagle (*Haliaeetus leucocephalus*)
E.............Pallid sturgeon (*Scaphirhynchus albus*) (*P*)

E.1.5.32. Wayne

T.............Louisiana black bear (*Ursus a. luteolus*) (P)
E.............Gray bat (*Myotis grisescens*)
E.............Red-cockaded woodpecker (*Picoides borealis*)
T.............Eastern indigo snake (*Drymarchon corais couperi*) (*P*)
C.............Black pine snake (*Pituophis melanoleucus ssp. lodingi*)
T.............Gopher tortoise (*Gopherus polyphemus*)
T.............Yellowblotched map turtle (*Graptemys flavimaculata*)
E.............Louisiana quillwort (*Isoetes louisianensis*)

E.1.5.33. Wilkinson

T.............Louisiana black bear (*Ursus a. luteolus*)
T.............Bald eagle (*Haliaeetus leucocephalus*)
E.............Red-cockaded woodpecker (*Picoides borealis*)
E.............Pallid sturgeon (*Scaphirhynchus albus*) (P)

E.1.6. Winston

E.............Red-cockaded woodpecker (*Picoides borealis*)
T.............Bald eagle (*Haliaeetus leucocephalus*)

E.1.6.1. Yalobusha

T.............Bald eagle (*Haliaeetus leucocephalus*)
E.............Red-cockaded woodpecker (*Picoides borealis*)

E.1.6.2. Yazoo

T.............Louisiana black bear (*Ursus a. luteolus*)
T.............Bald eagle (*Haliaeetus leucocephalus*)
E.............Pallid sturgeon (*Scaphirhynchus albus*) (P)

E.2. S1 AND S2 SPECIES

The following species are listed by the Natural Heritage Programs of Alabama and Mississippi as State imperiled species. The Heritage ranking system was developed by The Nature Conservancy. The State ranked species are species of concern and will be managed by the BLM to prevent any further reduction in species numbers or critical habitat loss. An S1 species as defined by The Nature Conservancy is “critically imperiled in the state because of extreme rarity (5 or fewer occurrences of very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extirpation from the state.” An S2 species as defined by The Nature Conservancy is “imperiled in the state because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extirpation from Alabama.”

E.2.1. S1 and S2 Species in Alabama

E.2.1.1. Mammals

S2 ....Black bear (*Ursus americanus*)
S2 ....Rafinesque's big-eared bat (*Corynorhinus rafinesquii*)
S1 ....Northern yellow bat (*Lasiurus intermedius*)
S2 ....Southeastern myotis (*Myotis austroriparius*)
S2 ....Gray bat (*Myotis grisescens*)
S1 ....Eastern small-footed myotis (*Myotis leibii*)
S2 ....Northern myotis (*Myotis septentrionalis*)
S2 ....Indiana bat (*Myotis sodalis*)
S1 ....Appalachian cottontail (*Sylvilagus obscurus*)
S1 ....Alabama beach mouse (*Peromyscus polionotus ammobates*)
S1 ....Perdido key beach mouse (*Peromyscus polionotus trissyllepsis*)
S2 ....West Indian manatee (*Trichechus manatus*)

E.2.1.2. Birds

Due to the migratory nature of birds, additional ranking systems from The Nature Conservancy are applied here. "SB are regularly occurring migratory and present only during the breeding season." "SN are regularly occurring, usually migratory and typically non-breeding species in the state; this category includes migratory birds, bats, sea turtles, and cetaceans which do not breed in the state but pass through twice a year or may remain in winter."

S1BS2N .Southeastern snowy plover (*Charadrius alexandrinus tenuirostris*)
S1N ....Piping plover (*Charadrius melodus*)
S1 ....Wilson's plover (*Charadrius wilsonia*)
S2N ....Long-billed curlew (*Numenius americanus*)
S2N ....Wood stork (*Mycteria americana*)
S2N ....Groove-billed ani (*Crotophaga sulcirostris*)
S2 ....Swallow-tailed kite (*Elanoides forficatus*)
S1 ....Ruffed grouse (*Bonasa umbellus*)
S1 ....Appalachian Bewick's wren (*Thryomanes bewickii altus*)
S1 ....Bewick's wren (*Thryomanes bewickii bewickii*)
S2 ....Red-cockaded woodpecker (*Picoides borealis*)

E.2.1.3. Reptiles

S2 ....Mimic glass lizard (*Ophisaurus mimicus*)
S1 ....Eastern indigo snake (*Drymarchon couperi*)
S1S2 ....Prairie kingsnake (*Lampropeltis calligaster calligaster*)
S2 ....Red milk snake (*Lampropeltis triangulum syspila*)
S2 ....Eastern milk snake (*Lampropeltis triangulum triangulum*)
S2 ....Gulf salt marsh snake (*Nerodia clarkii clarkia*)
S2 ....Green water snake (*Nerodia cyclopion*)
S2 ....Florida green water snake (*Nerodia floridana*)
S2 ....Black pine snake (*Pituophis melanoleucus lodingi*)
S2 ....Florida pine snake (*Pituophis melanoleucus mugitus*)
S2 ....Pine woods snake (*Rhadinaea flavilata*)
S2 ....Black swamp snake (*Seminatrix pygaea*)

S1 ....Loggerhead sea turtle (*Caretta caretta*)
S1 ....Green sea turtle (*Chelonia mydas*)
S2 ....Barbour's map turtle (*Graptemys barbouri*)
S2 ....Escambia map turtle (*Graptemys ernsti*)
S2 ....Delta map turtle (*Graptemys nigrinoda delticola*)
S2 ....Mississippi diamondback terrapin (*Malaclemys terrapin pileata*)
S1 ....Alabama redbelly turtle (*Pseudemys alabamensis*)
S1 ....Razorback musk turtle (*Sternotherus carinatus*)
S2 ....Flattened musk turtle (*Sternotherus depressus*)
S2 ....Gopher tortoise (*Gopherus polyphemus*)
S2 ....Florida softshell (*Apalone ferox*)

E.2.1.4. Amphibians

S2 ....Pine barrens treefrog (*Hyla andersonii*)
S1 ....Little grass frog (*Pseudacris ocularis*)
S2 ....Gopher frog (*Rana capito*)
S1 ....River frog (*Rana heckscheri*)
S2 ....Wood frog (*Rana sylvatica*)
S1 ....Flatwoods salamander (*Ambystoma cingulatum*)
S1 ....One-toed amphiuma (*Amphiuma pholeter*)
S2 ....Hellbender (*Cryptobranchus alleganiensis*)
S2 ....Seepage salamander (*Desmognathus aeneus*)
S2 ....Southern dusky salamander (*Desmognathus auriculatus*)
S2 ....Mountain dusky salamander (*Desmognathus ocoee*)
S2 ....Pale salamander (*Gyrinophilus palleucus palleucus*)
S2 ....Red Hills salamander (*Phaeognathus hubrichti*)
S2 ....Black warrior waterdog (*Necturus alabamensis*)

E.2.1.5. Snails

S1 ....Slender campiloma (*Campeloma decampi*)
S1 ....Cylindrical lioplax (*Lioplax cyclostomaformis*)
S1 ....Alabama livebearing snail (*Tulotoma magnifica*)
S2 ....Hood ancylid (*Ferrissia mcneili*)
S1 ....Domed ancylid (*Rhodacme elatior*)
S2 ....Knobby ancylid (*Rhodacme hinkleyi*)
S1 ....Manitou snail (*Antrorbis breweri*)
S1 ....Cahaba pebblesnail (*Clappia cahabensis*)
S1 ....Flat pebblesnail (*Lepyrium showalteri*)
S1 ....Angled marstonia (*Marstonia angulobasis*)
S1 ....Coosa pyrg (*Marstonia hershleri*)
S1 ....Armored marstonia (*Marstonia pachyta*)
S1 ....Moss pyrg (*Marstonia scalariformis*)
S2 ....Teardrop snail (*Rhapinema dacryon*)
S1 ....Anthony's river snail (*Athearnia anthonyi*)
S1 ....Acute elimia (*Elimia acuta*)
S1 ....Mud elimia (*Elimia alabamensis*)
S1 ....Ample elimia (*Elimia ampla*)
S1 ....Lilyshoals elimia (*Elimia annettae*)
S1 ....Princess elimia (*Elimia bellacrenata*)

S1 .... Walnut elimia (*Elimia bellula*)
S2 .... Rusty elimia (*Elimia bentoniensis*)
S1 .... Brooch elimia (*Elimia broccata*)
S1S2 .... A freshwater snail (*Elimia bullula*)
S2 .... Prune elimia (*Elimia chiltonensis*)
S1 .... Cockle elimia (*Elimia cochliaris*)
S1 .... Hispid elimia (*Elimia comma*)
S1 .... Lacey elimia (*Elimia crenatella*)
S1 .... Graphite elimia (*Elimia curvicostata*)
S2 .... Cylinder elimia (*Elimia cylindracea*)
S2 .... Fire elimia (*Elimia exusta*)
S2 .... Gladiator elimia (*Elimia hydei*)
S2 .... Sowwater elimia (*Elimia interveniens*)
S1 .... Teardrop elimia (*Elimia lachryma*)
S2 .... Panel elimia (*Elimia laqueata*)
S1 .... Black mudalia (*Elimia melanoides*)
S1 .... Latticed elimia (*Elimia mihalcikae*)
S2 .... Oak elimia (*Elimia mutabilis*)
S1 .... Round-rib elimia (*Elimia nassula*)
S1 .... Caper elimia (*Elimia olivula*)
S1 .... Engraved elimia (*Elimia perstriata*)
S2 .... Spring elimia (*Elimia pybasi*)
S1 .... Compact elimia (*Elimia showalteri*)
S1 .... Auger elimia (*Elimia teretria*)
S1 .... Creek elimia (*Elimia ucheensis*)
S1 .... Cobble elimia (*Elimia vanuxemiana*)
S1 .... Puzzle elimia (*Elimia varians*)
S1 .... Squat elimia (*Elimia variata*)
S2 .... Round rocksnail (*Leptoxis ampla*)
S1 .... Spotted rocksnail (*Leptoxis picta*)
S1 .... Plicate rocksnail (*Leptoxis plicata*)
S1 .... Painted rocksnail (*Leptoxis taeniata*)
S1 .... Armored rocksnail (*Lithasia armigera*)
S1 .... Knobby rocksnail (*Lithasia curta*)
S1 .... Ornate rocksnail (*Lithasia geniculata*)
S1 .... Rustic rocksnail (*Lithasia salebrosa*)
S2 .... Rugged hornsnail (*Pleurocera alveare*)
S2 .... Spiral hornsnail (*Pleurocera brumbyi*)
S1 .... Corpulent hornsnail (*Pleurocera corpulenta*)
S1S2 .... Shortspire hornsnail (*Pleurocera curta*)
S1 .... Rough hornsnail (*Pleurocera foremani*)
S2 .... Noble hornsnail (*Pleurocera nobilis*)
S2 .... Broken hornsnail (*Pleurocera postelli*)
S2 .... Skirted hornsnail (*Pleurocera pyrenella*)
S2 .... Upland hornsnail (*Pleurocera showalteri*)
S2 .... Sulcate hornsnail (*Pleurocera trochiformis*)
S2 .... Brook hornsnail (*Pleurocera vestita*)

E.2.1.6. Mussels

S1 .... Spectaclecase (*Cumberlandia monodonta*)

S1 .... Alabama pearlshell (*Margaritifera marriana*)
S2 .... A mucket (*Actinonaias ligamentina*)
S1 .... Pheasantshell (*Actinonaias pectorosa*)
S1 .... Southern elktoe (*Alasmidonta triangulata*)
S1 .... Slippershell mussel (*Alasmidonta viridis*)
S1 .... Apalachicola floater (*Anodonta heardi*)
S1S2 .... Rayed creekshell (*Anodontoides radiatus*)
S1 .... Fanshell (*Cyprogenia stegaria*)
S2 .... Alabama spike (*Elliptio arca*)
S2 .... Delicate spike (*Elliptio arctata*)
S1 .... Spike (*Elliptio dilatata*)
S2 .... Fluted elephant-ear (*Elliptio mcmichaeli*)
S1 .... Inflated spike (*Elliptio purpurella*)
S1 .... Purple bankclimber (*Elliptoideus sloatianus*)
S1 .... Cumberlandian combshell (*Epioblasma brevidens*)
S1 .... Southern combshell (*Epioblasma penita*)
S1 .... Snuffbox (*Epioblasma triquetra*)
S1 .... Tennessee pigtoe (*Fusconaia barnesiana*)
S2 .... Shiny pigtoe (*Fusconaia cor*)
S1 .... Fine-rayed pigtoe (*Fusconaia cuneolu*s)
S2 .... Narrow pigtoe (*Fusconaia escambia*)
S1S2 .... Wabash pigtoe (*Fusconaia flava*)
S1 .... Round ebonyshell (*Fusconaia rotulata*)
S1 .... Long-solid (*Fusconaia subrotunda*)
S2 .... Fine-lined pocketbook (*Hamiota altilis*)
S1S2 .... Southern sandshell (*Hamiota australis*)
S2 .... Orange-nacre mucket (*Hamiota perovalis*)
S1 .... Shiny-rayed pocketbook (*Hamiota subangulata*)
S1 .... Pink mucket (*Lampsilis abrupta*)
S1S2 .... Wavy-rayed lampmussel (*Lampsilis fasciola*)
S2 .... Louisiana fatmucket (*Lampsilis hydiana*)
S2 .... Rough fatmucket (*Lampsilis straminea straminea*)
S1 .... Alabama lampmussel (*Lampsilis virescens*)
S2 .... Fluted-shell (*Lasmigona costata*)
S1S2 .... Tennessee heelsplitter (*Lasmigona holstonia*)
S1 .... Slabside pearlymussel (*Lexingtonia dolabelloides*)
S2 .... Black sandshell (*Ligumia recta*)
S1 .... Alabama moccasinshell (*Medionidus acutissimus*)
S1 .... Cumberland moccasinshell (*Medionidus conradicus*)
S1S2 .... Gulf moccasinshell (*Medionidus penicillatus*)
S1S2 .... Southern hickorynut (*Obovaria jacksoniana*)
S1 .... Ring pink (*Obovaria retusa*)
S2 .... Round hickorynut (*Obovaria subrotunda*)
S2 .... Alabama hickorynut (*Obovaria unicolor*)
S1 .... White wartyback (*Plethobasus cicatricosus*)
S1 .... Orange-foot pimpleback (*Plethobasus cooperianus*)
S1 .... Sheepnose (*Plethobasus cyphyus*)
S1 .... Painted clubshell (*Pleurobema chattanoogaense*)
S2 .... Ohio pigtoe (*Pleurobema cordatum*)
S2 .... Southern clubshell (*Pleurobema decisum*)
S1 .... Dark pigtoe (*Pleurobema furvum*)

S1 .... Southern pigtoe (*Pleurobema georgianum*)
S1 .... Tennessee clubshell (*Pleurobema oviforme*)
S1 .... Ovate clubshell (*Pleurobema perovatum*)
S1 .... Rough pigtoe (*Pleurobema plenum*)
S1 .... Oval pigtoe (*Pleurobema pyriforme*)
S1 .... Warrior pigtoe (*Pleurobema rubellum*)
S1 .... Pyramid pigtoe (*Pleurobema rubrum*)
S1 .... Round pigtoe (*Pleurobema sintoxia*)
S2 .... Fuzzy pigtoe (*Pleurobema strodeanum*)
S1 .... Heavy pigtoe (*Pleurobema taitianum*)
S1 .... Inflated heelsplitter (*Potamilus inflatus*)
S1 .... Kidneyshell (*Ptychobranchus fasciolaris*)
S1 .... Triangular kidneyshell (*Ptychobranchus greenii*)
S1 .... Southern kidneyshell (*Ptychobranchus jonesi*)
S1 .... Rabbitsfoot (*Quadrula cylindrica cylindrica*)
S1S2 .... Wartyback (*Quadrula nodulata*)
S1 .... Tapered pigtoe (*Quadrula burkei*)
S1 .... Sculptured pigtoe (*Quincuncina infucata*)
S2 .... Alabama creekmussel (*Strophitus connasaugansis*)
S2 .... Southern creekmussel (*Strophitus subvexus*)
S1 .... Squawfoot (*Strophitus unduluatus*)
S1 .... Southern lilliput (*Toxolasma corvunculus*)
S1 .... Pale lilliput (*Toxolasma cylindrellus*)
S2 .... Purple lilliput (*Toxolasma lividus*)
S2 .... Iridescent lilliput (*Toxolasma paulus*)
S1 .... Deertoe (*Truncilla truncata*)
S2 .... Florida floater (*Utterbackia peggyae*)
S2 .... Choctaw bean (*Villosa choctawensis*)
S2 .... Coosa creekshell (*Villosa vanuxemensis umbrans*)

E.2.1.7. Crustaceans

S1 .... Alabama cave shrimp (*Palaemonias alabamae*)
S1 .... Tuscumbia cave shrimp (*Palaemonias sp.1*)
S2 .... A crayfish (*Cambarus acanthura*)
S1 .... A crayfish (*Cambarus cracens*)
S2 .... A crayfish (*Cambarus hamulatus*)
S2 .... Alabama cave crayfish (*Cambarus jonesi*)
S2 .... A crayfish (*Cambarus ludovicanus*)
S2 .... A crayfish (*Cambarus manningi*)
S2 .... Rusty grave digger (*Cambarus miltus*)
S2 .... A crayfish (*Cambarus unestami*)
S1 .... White Spring Cave crayfish (*Cambarus veitchorum*)
S1 .... Speckled burrowing crayfish (*Fallicambarus danielae*)
S1 .... A crayfish (*Orconectes cooperi*)
S1 .... A crayfish (*Orconectes lancifer*)
S1 .... A crayfish (*Orconectes sheltie*)

E.2.1.8. Fish

S1 .... Gulf sturgeon (*Acipenser oxyrinchus desotoi*)

S1 ....Alabama sturgeon (*Scaphirhynchus suttkusi*)
S2 ....Alabama shad (*Alosa alabamae*)
S2 ....River carpsucker (*Carpiodes carpio*)
S2 ....Silver redhorse (*Moxostoma anisurum*)
S2 ....Apalachicola redhorse (*Moxostoma sp. cf. poecilurum*)
S2 ....Bluefin stoneroller (*Campostoma pauciradii*)
S1 ....Blue shiner (*Cyprinella caerulea*)
S2 ....Bluestripe shiner (*Cyprinella callitaenia*)
S1 ....Streamline chub (*Erimystax dissimilis*)
S2 ....Blotched chub (*Erimystax insignis*)
S1 ....Warpaint shiner (*Luxilus coccogenis*)
S2 ....Ribbon shiner (*Lythrurus fumeus*)
S2 ....Cherryfin shiner (*Lythrurus roseipinnis*)
S2 ....River chub (*Nocomis micropogon*)
S1 ....Palezone shiner (*Notropis albizonatus*)
S2 ....Popeye shiner (*Notropis ariommus*)
S2 ....Bigeye shiner (*Notropis boops*)
S2 ....Ghost shiner (*Notropis buchanani*)
S2 ....Cahaba shiner (*Notropis cahabae*)
S1 ....Ironcolor shiner (*Notropis chalybaeus*)
S2 ....Dusky shiner (*Notropis cummingsae*)
S2 ....Highscale shiner (*Notropis hypsilepis*)
S1 ....Tennessee shiner (*Notropis leuciodus*)
S2 ....Highland shiner (*Notropis micropteryx*)
S2 ....Coastal shiner (*Notropis petersoni*)
S1 ....Silver shiner (*Notropis photogenis*)
S2 ....Sawfin shiner (*Notropis sp cf. spectrunculus*)
S1 ....Sand shiner (*Notropis stramineus*)
S2 ....Skygazer shiner (*Notropis uranoscopus*)
S1 ....Channel shiner (*Notropis wickliffi*)
S1 ....Suckermouth minnow (*Phenacobius mirabilis*)
S1 ....Stargazing minnow (*Phenacobius uranops*)
S2 ....Broadstripe shiner (*Pteronotropis euryzonus*)
S2 ....Bluenose shiner (*Pteronotropis welaka*)
S2 ....Banded topminnow (*Fundulus auroguttatus*)
S2 ....Stippled studfish (*Fundulus bifax*)
S2 ....Lowland topminnow (*Fundulus blairae*)
S2 ....Starhead topminnow (*Fundulus dispar*)
S1 ....Saltmarsh topminnow (*Fundulus jenkinsi*)
S1 ....Pygmy killifish (*Leptolucania ommata*)
S1 ....Bluefin killifish (*Lucania goodei*)
S2 ....Alligator gar (*Atractosteus spatula*)
S1 ....Banded sunfish (*Enneacanthus obesus*)
S2 ....Shoal bass (*Micropterus cataractae*)
S1 ....Spring pygmy sunfish (*Elassoma alabamae*)
S1 ....Scaly sand darter (*Ammocrypta vivax*)
S2 ....Warrior darter (*Etheostoma bellator*)
S1 ....Blenny darter (*Etheostoma blennius*)
S1 ....Slackwater darter (*Etheostoma boschungi*)
S1 ....Holiday darter (*Etheostoma brevirostrum*)
S1 ....Bluebreast darter (*Etheostoma camurum*)

S1 ....Vermilion darter (*Etheostoma chermocki*)
S2 ....Lipstick darter (*Etheostoma chuckwachatte*)
S2 ....Crown darter (*Etheostoma corona*)
S1 ....Fringed darter (*Etheostoma crossopterum*)
S1 ....Coldwater darter (*Etheostoma ditrema*)
S2 ....Tuskaloosa darter (*Etheostoma douglasi*)
S1 ....Brighteye darter (*Etheostoma lynceum*)
S1 ....Lollipop darter (*Etheostoma neopterum*)
S1 ....Watercress darter (*Etheostoma nuchale*)
S1 ....Rush darter (*Etheostoma phytophilum*)
S1 ....Upper Coosa darter nr. (*E. ditrema2 Etheostoma sp 1*)
S1 ....Lower Coosa darter nr. (*E. ditrema2 Etheostoma sp 3*)
S2 ....Sipsey darter (*Etheostoma sp. cf. bellator*)
S2 ....Tuscumbia darter (*Etheostoma tuscumbia*)
S1 ....Boulder darter (*Etheostoma wapiti*)
S2 ....Banded darter (*Etheostoma zonale*)
S1 ....Bandfin darter (*Etheostoma zonistium*)
S2 ....Yellow perch (*Perca flavescens*)
S1 ....Goldline darter (*Percina aurolineata*)
S2 ....Southern logperch (*Percina austroperca*)
S2 ....Coal darter (*Percina brevicauda*)
S1 ....Blotchside darter (*Percina burtoni*)
S2 ....Gilt darter (*Percina evides*)
S1 ....Slenderhead darter (*Percina phoxocephala*)
S2 ....Muscadine darter (*Percina* sp cf. *macrocephala*)
S1 ....Warrior bridled darter (*Percina sp cf. macrocephala*)
S1 ....Snail darter (*Percina tanasi*)
S1 ....Alabama cavefish (*Speoplatyrhinus poulsoni*)
S2 ....Mottled sculpin (*Cottus bairdi*)
S1 ....Pygmy sculpin (*Cottus paulus*)
S2 ....Spotted bullhead (*Ameiurus serracanthus*)
S1 ....Mountain madtom (*Noturus eleutherus*)
S1 ....Highlands stonecat (*Noturus sp. cf. flavus*)
S1 ....Brindled madtom (*Noturus miurus*)
S2 ....Frecklebelly madtom (*Notorus munitus*)
S2 ....Chestnut lamprey (*Ichthyomyzon castaneus*)
S1 ....Mountain brook lamprey (*Ichthyomyzon greeleyi*)
S1 ....American brook lamprey (*Lampetra appendix*)

E.2.1.9. Plants

S1 ....Dwarf burhead (*Echinodorus parvulus*)
S2 ....Slender arrow-head (*Sagittaria isoetiformis*)
S1 ....Little River arrow-head (*Sagittaria secundifolia*)
S1 ....Sweetflag (*Acorus calamus*)
S2 ....Spoon flower (*Peltandra sagittfolia*)
S1 ....Kral’s yellow-eyed grass (*Xyris longisepala*)
S1S2 ....Harper’s yellow-eyed grass (*Xyris scabrifolia*)
S1 ....Acid-swamp yellow-eyed grass (*Xyris serotina*)
S1 ....Tennessee yellow-eyed grass (*Xyris tennesseensis*)
S1 ....A sedge (*Carex acidicola*)

S1 ....Glomerate sedge (*Carex aggregata*)
S1 ....Baltzell’s sedge (*Carex baltzellii*)
S1 ....Bryson’s sedge (*Carex brysonii*)
S1 ....Cypress-knee sedge (*Carex decomposita*)
S2 ....Ebony sedge (*Carex eburnea*)
S1 ....Coast sedge (*Carex exilis*)
S1 ....Godfrey’s sedge (*Carex godfreyi*)
S1 ....Impressed-nerved sedge (*Carex impressinervia*)
S2 ....Purple sedge (*Carex purpurifera*)
S1 ....Walter’s sedge (*Carex striata*)
S1 ....A sedge (*Carex thornei*)
S1 ....Velvety sedge (*Carex vestita*)
S1 ....Twig rush (*Cladium mariscoides*)
S2 ....Granite-loving flatsedge (*Cyperus granitophilus*)
S1 ....Black-fruited spike-rush (*Eleocharis melanocarpa*)
S1 ....Capitate spikerush (*Eleocharis olivacea*)
S1 ....Robbins‘ spikerush (*Eleocharis robbinsii*)
S1 ....Beaked spikerush (*Eleocharis rostellata*)
S1 ....Wolf s spikerush (*Eleocharis wolfii*)
S1 ....Glade fimbristylis (*Fimbristylis brevivaginata*)
S1 ....Horned beakrush (*Rhynchospora capillacea*)
S1 ....Hairy-peduncled beakrush (*Rhynchospora crinipes*)
S1 ....Harper beakrush (*Rhynchospora harperi*)
S1 ....Southern white beak rush (*Rhynchospora macra*)
S1 ....Brown beakrush (*Rhynchospora pleiantha*)
S1 ....Stone Mountain beakrush (*Rhynchospora saxicola*)
S2 ....Chapman beakrush (*Rhynchospora stenophylla*)
S1 ....Thorne s beakrush (*Rhynchospora thornei*)
S1 ....Tracys beak rush (*Rhynchospora tracyi*)
S1 ....Blue maiden-cane (*Amphicarpum muehlenbergianum*)
S1 ....Pine-woods bluestem (*Andropogon arctatus*)
S2 ....Beardgrass (*Andropogon capillipes*)
S1 ....Beardgrass (*Andropogon gyrans var. stenophyllus*)
S1 ....Southern three-awned grass (*Aristida simpliciflora*)
S1 ....Cumberland sandgrass (*Calamovilfa arcuata*)
S1 ....Shiny spikegrass (*Chasmanthium nitidum*)
S1 ....Florida jointgrass (*Coelorachis tuberculosa*)
S2 ....American beakgrain (*Diarrhena americana*)
S1 ....Brazilian luziola (*Luziola bahiensis*)
S1 ....Three-flower melic grass (*Melica nitens*)
S1 ....Cliff muhly (*Muhlenbergia sobolifera*)
S1 ....Swallen’s panic-grass (*Panicum lithophilum*)
S2 ....Naked-stemmed panic grass (*Panicum nudicaule*)
S1 ....Gulf bluestem (*Schizachyrium maritimum*)
S1 ....Pineland dropseed (*Sporobolus curtissii*)
S1 ....Wire-leaved dropseed (*Sporobolus teretifolius*)
S1 ....Carolina fluff grass (*Tridens carolinianus*)
S2 ....Narrow pipewort (*Eriocaulon lineare*)
S2 ....Texas pipewort (*Eriocaulon texense*)
S2 ....Pineland bogbutton (*Lachnocaulon digynum*)
S1 ....Broad waterweed (*Elodea canadensis*)

S1 ....Georgia rush (*Juncus georgianus*)
S2 ....Naked-fruited rush (*Juncus gymnocarpus*)
S1 ....Stout rush (*Juncus nodatus*)
S1 ....Prairie pleatleaf (*Nemastylis geminiflora*)
S2 ....Little River Canyon onion (*Allium speculae*)
S1 ....Wild leek (*Allium tricoccum*)
S1S2 ....White trout lily (*Erythronium albidum*)
S2 ....Shoals spider-lily (*Hymenocallis coronaria*)
S2 ....Canada lily (*Lilium canadense*)
S1 ....Panhandle lily (*Lilium iridollae*)
S1 ....Michigan lily (*Lilium michiganense*)
S2 ....Turks-cap lily (*Lilium superbum*)
S1 ....Broadleaf bunchflower (*Melanthium latifolium*)
S1S2 ....Small-flowered false hellebore (*Melanthium parviflorum*)
S1 ....Wood s false hellebore (*Melanthium woodii*)
S1S2 ....Rush false-asphodel (*Pleea tenuifolia*)
S1 ....Spotted mandarin (*Prosartes maculate*)
S2 ....Yellow sunnybell (*Schoenolirion croceum*)
S1 ....Texas sunnybell (*Schoenolirion wrightii*)
S1 ....Large-flowered trillium (*Trillium grandiflorum*)
S2 ....Alabama least trillium (*Trillium pusillum var. 1*)
S2 ....Prairie trillium (*Trillium recurvatum*)
S2 ....Relict trillium (*Trillium reliquum*)
S2 ....Toadshade (*Trillium sessile*)
S1 ....Southern red trillium (*Trillium sulcatum*)
S1 ....Florida bellwort (*Uvularia floridana*)
S1 ....Turkeybeard (*Xerophyllum asphodeloides*)
S1 ....Crow-poison (*Zigadenus leimanthoides*)
S2 ....Croomia (*Croomia pauciflora*)
S1 ....Thread-like naiad (*Najas gracillima*)
S1 ....Florida pondweed (*Potamogeton floridanus*)
S2 ....Bluethreads (*Burmannia capitata*)
S2 ....Puttyroot (*Aplectrum hyemale*)
S1 ....Bearded grass-pink (*Calopogon barbatus*)
S1 ....Many-flowered grass-pink (*Calopogon multiflorus*)
S1 ....Oklahoma grass-pink (*Calopogon oklahomensis*)
S2 ....Spring coralroot (*Corallorhiza wisteriana*)
S1 ....Small white lady s-slipper (*Cypripedium candidum*)
S1 ....Southern lady s-slipper (*Cypripedium kentuckiense*)
S2 ....Green-fly orchid (*Epidendrum conopseum*)
S1 ....Michauxs orchid (*Habenaria quinqueseta var. quinqueseta*)
S2 ....Large whorled pogonia (*Isotria verticillata*)
S1 ....Lily-leaved twayblade (*Liparis liliifolia*)
S1S2 ....Large white fringed orchid (*Platanthera blephariglottis var. conspicua*)
S2 ....Yellow fringeless orchid (*Platanthera integra*)
S2 ....White fringeless orchid (*Platanthera integrilabia*)
S2 ....Green-fringed orchid (*Platanthera lacera*)
S1 ....Purple fringeless orchid (*Platanthera peramoena*)
S2 ....Shadow-witch orchid (*Ponthieva racemosa*)
S1 ....Crestless eulophia (*Pteroglossaspis ecristata*)
S1 ....Giant spiral ladies-tresses (*Spiranthes longilabris*)

S1 .... Shining ladies-tresses (*Spiranthes lucida*)
S1 .... Golden canna (*Canna flaccida*)
S1 .... Carolina lilaeopsis (*Lilaeopsis carolinensis*)
S1 .... Eastern bishop-weed (*Ptilimnium costatum*)
S1 .... Harperella (*Ptilimnium nodosum*)
S1 .... Florida water-parsnip (*Sium floridanum*)
S1 .... American spikenard (*Aralia racemosa*)
S2 .... Harper’s wild ginger (*Hexastylis shuttleworthii var. harperi*)
S2 .... Harper’s heartleaf (*Hexastylis speciosa*)
S1 .... Variable-leaved Indian plantain (*Arnoglossum diversifolium*)
S1 .... Nodding beggar-ticks (*Bidens cernua*)
S2 .... Flyr’s brickell-bush (*Brickellia cordifolia*)
S1 .... Godfrey’s golden-aster (*Chrysopsis godfreyi*)
S1 .... Swamp thistle (*Cirsium muticum*)
S2 .... Southeastern tickseed (*Coreopsis gladiata*)
S2 .... Tickseed (*Coreopsis grandiflora var. inclinata*)
S1 .... Georgia tickseed (*Coreopsis nudata*)
S2 .... Woodland tickseed (*Coreopsis pulchra*)
S2 .... Pale-purple coneflower (*Echinacea pallida*)
S1 .... Wavy-leaf purple coneflower (*Echinacea simulata*)
S2 .... Coyote-thistle aster (*Eurybia eryngiifolia*)
S2 .... Showy aster (*Eurybia specatabilis*)
S1 .... Creeping aster (*Eurybia surculosus*)
S1 .... Little leaf sneezeweed (*Helenium brevifolium*)
S2 .... Spring sneezeweed (*Helenium vernale*)
S1 .... Eggert’s sunflower (*Helianthus eggertii*)
S1S2 .... Longleaf sunflower (*Helianthus longifolius*)
S2 .... Confederate daisy (*Helianthus porteri*)
S2 .... Smith’s sunflower (*Helianthus smithii*)
S1 .... Whorled sunflower (*Helianthus verticillatus*)
S1 .... Small-headed marsh-elder (*Iva microcephala*)
S1 .... Mountain dwarf dandelion (*Krigia montana*)
S2 .... Slender blazing-star (*Liatris cylindracea*)
S1 .... A liatris (*Liatris oligocephala*)
S1 .... Pineland false sunflower (*Phoebanthus tenuifolius*)
S1 .... Coastal-Plain golden-aster (*Pityopsis oligantha*)
S1 .... Golden aster (*Pityopsis pinifolia*)
S1S2 .... Barbed rattlesnake-root (*Prenanthes barbata*)
S1 .... Eared coneflower (*Rudbeckia auriculata*)
S2 .... Sun-facing coneflower (*Rudbeckia heliopsidis*)
S1 .... Soft-hair coneflower (*Rudbeckia mollis*)
S2 .... Cumberland rosinweed (*Silphium brachiatum*)
S1 .... Rosinweed (*Silphium glutinosum*)
S1 .... Mohr s rosinweed (*Silphium mohrii*)
S1 .... Rosinweed (*Silphium perplexum*)
S1 .... Prairie-dock (*Silphium pinnatifidum*)
S1 .... A goldenrod (*Solidago arenicola*)
S1 .... Heath aster (*Symphyotrichum ericoides*)
S2 .... Smooth blue aster (*Symphyotrichum laeve var. concinnum*)
S1 .... Sky blue aster (*Symphyotrichum oolentangiense var. oolentangiense*)
S1 .... Barrens silky aster (*Symphyotrichum pretense*)

S1 ....Western silvery aster (*Symphyotrichum sericeum*)
S1S2 ....Boydin’s lobelia (*Lobelia boykinii*)
S1 ....Georgia rock-cress (*Arabis georgiana*)
S1 ....Lake cress (*Armoracia lacustris*)
S1 ....Wedge-leaf Whitlow-grass (*Draba cuneifolia*)
S2 ....Alabama glade-cress (*Leavenworthia alabamica*)
S1 ....Fleshy-fruit glade cress (*Leavenworthia crassa*)
S1 ....Pasture glade-cress (*Leavenworthia exigua var. lutea*)
S2 ....Michaux leavenworthia (*Leavenworthia uniflora*)
S1 ....Duck river bladderpod (*Lesquerella densipila*)
S1 ....Lyrate bladderpod (*Lesquerella lyrata*)
S1 ....Sessile-leaved warea (*Warea sessilifolia*)
S1 ....Slenderleaf clammy-weed (*Polanisia tenuifolia*)
S2 ....Alabama sandwort (*Minuartia alabamensis*)
S1 ....Coastal plain nailwort (*Paronychia herniarioides*)
S2 ....Yellow nailwort (*Paronychia virginica*)
S1S2 ....Sherry’s catchfly (*Silene caroliniana ssp. wherryi*)
S2 ....Ovate catchfly (*Silene ovata*)
S1S2 ....Roundleaf catchfly (*Silene rotundifolia*)
S1 ....Chickweed (*Stellaria corei*)
S2 ....Pale umbrella-wort (*Mirabilis albida*)
S1 ....Carolina spring beauty (*Claytonia caroliniana*)
S2 ....Limestone fame-flower (*Talinum calcaricum*)
S1 ....Small-flowered flame-flower (*Talinum parviflorum*)
S1 ....Quill fameflower (*Talinum teretifolium*)
S2 ....Serviceberry holly (*Ilex amelanchier*)
S2 ....Climbing bittersweet (*Celastrus scandens*)
S2 ....Mountain bush-honeysuckle (*Diervilla rivularis*)
S1 ....Yellowleaf tinker’s-weed (*Triosteum angustifolium*)
S1 ....Limerock arrowwood (*Viburnum bracteatum*)
S1 ....Small-leaf viburnum (*Viburnum obovatum*)
S1 ....Valerian (*Valeriana pauciflora*)
S1 ....Swamp buckthorn (*Sideroxylon thornei*)
S2 ....Silverbell (*Halesia tetraptera var. tetraptera*)
S1 ....Mountain pepper-bush (*Clethra acuminate*)
S2 ....Hairy laurel (*Kalmia hirsute*)
S2 ....Climbing fetter-bush (*Pieris phillyreifolia*)
S2 ....Cumberland rhododendron (*Rhododendron cumberlandense*)
S2 ....Carolina rhododendron (*Rhododendron minus*)
S1 ....Sweet pinesap (*Monotropsis odorata var. odorata*)
S1 ....Elliott’s croton (*Croton elliottii*)
S1 ....Florida pine spurge (*Euphorbia inundata*)
S1 ....Water toothleaf (*Stillingia aquatica*)
S2 ....Price s potato-bean (*Apios priceana*)
S1 ....Canadian milkvetch (*Astragalus canadensis*)
S1 ....Sandhills milk-vetch (*Astragalus michauxii*)
S1S2 ....Tennessee milk-vetch (*Astragalus tennesseensis*)
S2 ....Hoary milk-vetch (*Astragalus villosus*)
S1 ....Blue wild indigo (*Baptisia australis*)
S2 ....Apalachicola wild indigo (*Baptisia megacarpa*)
S1 ....Catbells (*Baptisia perfoliata*)

S1 ....Florida senna (*Chamaecrista deeringiana*)
S2 ....A prairie clover (*Dalea cahaba*)
S1 ....Leafy prairie clover (*Dalea foliosa*)
S1 ....Creamflower tick-trefoil (*Desmodium ochroleucum*)
S1 ....Smooth veiny peavine (*Lathyrus venosus*)
S2 ....Nashville breadroot (*Pediomelum subacaule*)
S1S2 ....Pineland hoary-pea (*Tephrosia mohrii*)
S2 ....Arkansas oak (*Quercus arkansana*)
S1 ....Boynton's sand post oak (*Quercus boyntonii*)
S2 ....Georgia oak (*Quercus georgiana*)
S2 ....Bur oak (*Quercus macrocarpa*)
S2 ....Dwarf live oak (*Quercus minima*)
S1 ....Oglethorpe's oak (*Quercus oglethorpensis*)
S1 ....Swamp post oak (*Quercus similis*)
S1 ....Stiff blue-star (*Amsonia rigida*)
S1 ....Carolina milkweed (*Asclepias cinera*)
S1 ....Red milkweed (*Asclepias rubra*)
S1 ....Southern milkweed (*Asclepias viridula*)
S1 ....Alabama anglepod (*Matelea alabamensis*)
S1 ....Baldwins's milkyvine (*Matelea baldwyniana*)
S2 ....Carolina gentian (*Frasera caroliniensis*)
S1 ....Elliott's gentian (*Gentiana catesbaei*)
S1 ....Short-leaved pink (*Sabatia brevifolia*)
S2 ....Rose gentian (*Sabatia capitata*)
S1 ....Narrow-leaf miterwort (*Mitreola angustifolia*)
S1 ....Gentian pinkroot (*Spigelia gentianoides var. alabamensis*)
S1 ....Gentian pinkroot (*Spigelia gentianoides var. gentianoides*)
S1 ....Giant wood-sorrel (*Oxalis grandis*)
S2 ....Piedmont water-milfoil (*Myriophyllum laxum*)
S1 ....Dwarf witch-alder (*Fothergilla gardenia*)
S2 ....Mountain witch-alder (*Fothergilla major*)
S2 ....Bay starvine (*Schisandra glabra*)
S2 ....Nutmeg hickory (*Carya myristiciformis*)
S1 ....Butternut (*Juglans cinerea*)
S2 ....Slabama marbleseed (*Onosmodium decipiens*)
S2 ....Soft false gromwell (*Onosmodium molle ssp. molle*)
S1 ....Yellow giant hyssop (*Agastache nepetoides*)
S1S2 ....Smooth blephilia (*Blephilia subnuda*)
S2 ....Large-flowered pennyroyal (*Dicerandra linearifolia*)
S2 ....Drummond's pennyroyal (*Hedeoma drummondii*)
S2 ....Basil bee-balm (*Monarda clinopodia*)
S1 ....Virginia mountain mint (*Pycnanthemum virginianum*)
S2 ....Alabama skullcap (*Scutellaria alabamensis*)
S1 ....Glabrous skullcap (*Scutellaria glabriuscula*)
S1 ....Rock skullcap (*Scutellaria saxatilis*)
S1 ....Epling's hedgenettle (*Stachys eplingii*)
S1 ....Guyandotte beauty (*Synandra hispidula*)
S1 ....Pondberry (*Lindera melissifolia*)
S1 ....Bog spicebush (*Lindera subcoriacea*)
S1 ....Flax (*Linum macrocarpum*)
S1 ....Harper's grooved-yellow flax (*Linum sulcatum var. harperi*)

S1 ....Fraser’s magnolia (*Magnolia fraseri*)
S2 ....Clustered poppy-mallow (*Callirhoe alcaeoides*)
S1 ....Clustered poppy-mallow (*Callirhoe triangulata*)
S1 ....Brilliant hibiscus (*Hibiscus coccineus*)
S1 ....Elliott’s fan-petal (*Sida elliottii*)
S1 ....Awned meadowbeauty (*Rhexia aristosa*)
S1 ....Small-flowered meadowbeauty (*Rhexia parviflora*)
S1 ....Panhandle meadowbeauty (*Rhexia salicifolia*)
S1 ....Willow herb (*Epilobium coloratum*)
S1S2 ....Spathulate seedbox (*Ludwigia spathulata*)
S1 ....Round-leaved sundew (*Drosera rotundifolia*)
S2 ....Green pitcher plant (*Sarracenia oreophila*)
S1S2 ....Alabama canebrake pitcher-plant (*Sarracenia rubra ssp. alabamensis*)
S1 ....West Florida cowlily (*Nuphar lutea ssp. ulvacea*)
S2 ....Dutchman’s breeches (*Dicentra cucullaria*)
S1 ....Celandine poppy (*Stylophorum diphyllum*)
S1 ....Heart-leaved plantain (*Plantago cordata*)
S1 ....Crenate milkwort (*Polygala crenata*)
S1S2 ....Hooker’s milkwort (*Polygala hookeri*)
S1 ....Seneca snakeroot (*Polygala senega var. latifolia*)
S1 ....Harper’s umbrella plant (*Eriogonum longifolium var. harperi*)
S1 ....Southern jointweed (*Polygonella americana*)
S1 ....Large-leaved jointweed (*Polygonella macrophylla*)
S1 ....French’s shooting star (*Dodecatheon frenchii*)
S2 ....Featherfoil (*Hottonia inflate*)
S1 ....Fraser’s loosestrife (*Lysimachia fraseri*)
S1 ....Grass-leaf loosestrife (*Lysimachia graminea*)
S2 ....Twinleaf (*Jeffersonia diphylla*)
S1 ....Blue monkshood (*Acontium uncinatum*)
S1 ....Marianna columbine (*Aquilegia canadensis var. australis*)
S1S2 ....Morefield’s leather-flower (*Clematis morefieldii*)
S1 ....Alabama leather-flower (*Clematis socialis*)
S1 ....Alabama larkspur (*Delphihium alabamicum*)
S1 ....Prairie larkspur (*Delphinium carolinianum ssp. calciphilum*)
S2 ....False rue-anemone (*Enemion biternatum*)
S2 ....Golden seal (*Hydrastis canadensis*)
S1 ....Yellow water-crowfoot (*Tanunculus flabellaris*)
S2 ....Granite gooseberry (*Ribes curvatum*)
S1S2 ....Prickly gooseberry (*Ribes cynosbati*)
S2 ....Incised groovebur (*Agrimonia incisa*)
S1 ....Ash’s hawthorn (*Crataegus ashei*)
S2 ....Three-flowered hawthorn (*Crataegus triflora*)
S1 ....Rough avens (*Geum laciniatum*)
S2 ....Pale avens (*Geum virginianum*)
S2 ....Alabama snow-wreath (*Neviusia alabamensis*)
S1 ....Allegheny blackberry (*Rubus allegheniensis*)
S1 ....Piedmont barren strawberry (*Waldsteinia lobata*)
S1 ....Brook saxifrage (*Boykinia aconitifolia*)
S1 ....Long-flower alumroot (*Heuchera longiflora*)
S1 ....Miterwort (*Mitella diphylla*)
S2 ....Kidneyleaf grass-of-parnassus (*Parnassia asarifolia*)

S1 ....Large-leaved grass-of-parnassus (*Parnassia grandifolia*)
S1 ....Torrey’s wild licorice (*Galium lanceolatum*)
S1 ....Florida willow (*Salix floridana*)
S1 ....Bastard-toadflax (*Comandra umbellate*)
S2 ....Nestronia (*Nestronia umbellula*)
S2 ....Buffalo-nut (*Pyrularia pubera*)
S2 ....American smoke-tree (*Cotinus obovatus*)
S1 ....Northern prickley ash (*Zanthoxylum americanum*)
S1 ....Oblon-leaved dyschoriste (*Dyschoriste oblongifolia*)
S1 ....Night-flowering wild-petunia (*Ruellia noctiflora*)
S1S2 ....Chapman’s butterwort (*Pinguicula planifolia*)
S1S2 ....Florida bladderwort (*Utricularia floridana*)
S1S2 ....Swollen bladderwort (*Utricularia inflate*)
S1 ....Piedmont bladderwort (*Utricularia olivacea*)
S1S2 ....Northeastern bladderwort (*Utricularia resupinata*)
S2 ....One-flowered broomrape (*Orobanche uniflora*)
S2 ....Leafless false-foxglove (*Agalinis aphylla*)
S1 ....Pineland false-foxglove (*Agalinis divaricata*)
S2 ....Thin-stemmed false-foxglove (*Agalinis filicaulis*)
S1 ....Georgia false-foxglove (*Agalinis georgiana*)
S2 ....Prairie false-foxglove (*Agalinis heterophylla*)
S2 ....Flax-leaf false-foxglove (*Agalinis linifolia*)
S1 ....Ridge-stem false-foxglove (*Agalinis oligophylla*)
S1 ....Shinners ‘ false-foxglove (*Agalinis pseudaphylla*)
S1 ....Granite pool sprite (*Amphianthus pusillus*)
S1 ....Spreading false-foxglove (*Aureolaria patula*)
S1 ....Scarlet indian paintbrush (*Castilleja coccinea*)
S2 ....An indian paintbrush (*Castilleja kraliana*)
S1 ....Pink turtlehead (*Chelone lyonii*)
S2 ....Flame flower (*Macranthera flammea*)
S1 ....Many-flower beardtongue (*Penstemon multiflorus*)
S1 ....Small’s beardtongue (*Penstemon smallii*)
S1 ....Chaffseed (*Schwalbea americana*)
S1 ....Culver’s root (*Veronicastrum virginicum*)
S1 ....Creeping morning-glory (*Evolvulus sericeus var. sericeus*)
S1 ....Water dawnflower (*Stylisma aquatica*)
S1 ....Pickering’s morning-glory (*Stylisma pickeringii var. pickeringii*)
S2 ....Harper’s dodder (*Cuscuta harperi*)
S1S2 ....Phacelia (*Phacelia dubia var. dubia*)
S2 ....Outcrop small-flower phacelia (*Phacelia dubia var. georgiana*)
S1S2 ....Christmas berry (*Lycium carolinianum*)
S1 ....Carpenter’s ground-cherry (*Physalis carpenteri*)
S1 ....Horse-nettle (*Solanum carolinense var. hirsutum*)
S1 ....Lloyd St. John s-wort (*Hypericum lloydii*)
S2 ....Carolina St. John’s-wort (*Hypericum nitidum*)
S2 ....Pretty St. John’s-wort (*Hypericum nudiflorum*)
S2 ....Atlantic St. John’s-wort (*Hypericum reductum*)
S1 ....Loblolly bay (*Gordonia lasianthus*)
S1 ....Coastal-sand frostweed (*Helianthemum arenicola*)
S2 ....Canada violet (*Viola canadensis*)
S1 ....Eggleston’s violet (*Viola egglestonii*)

S1 ....Ground juniper (*Juniperus communis*)
S2 ....Sand pine (*Pinus clausa*)
S1 ....Pond pine (*Pinus serotina*)

E.2.1.10. Ferns and Allies

S2 ....Bradley's spleenwort (*Asplenium bradleyi*)
S1 ....Single-sorus spleenwort (*Asplenium monanthes*)
S2 ....Wall rue spleenwort (*Asplenium ruta-muraria*)
S1 ....American hart's-tongue fern (*Asplenium scolopendrium var. americanum*)
S1 ....Scott's spleenwort (*Asplenium x ebenoides*)
S2 ....Tennessee bladderfern (*Cystopteris tennesseensis*)
S1 ....Log fern (*Dryopteris celsa*)
S1 ....Southern woodfern (*Dryopteris x australis*)
S1 ....Gorge filmy fern (*Hymenophyllum tayloriae*)
S2 ....Dwarf filmy fern (*Trichomanes petersii*)
S1 ....Hybrid cloak fern (*Astrolepis x integerrima*)
S2 ....Climbing fern (*Lygodium palmatum*)
S1 ....Alabama streak-sorus fern (*Thelypteris pilosa var. alabamensis*)
S2 ....Hairy maiden fern (*Thelypteris quadrangularis*)
S1 ....American pillwort (*Pilularia americana*)
S1 ....Alabama grapefern (*Botrychium jenmanii*)
S1 ....Appalachian quillwort (*Isoetes appalachiana*)
S2 ....Butler s quillwort (*Isoetes butleri*)
S1 ....Southern quillwort (*Isoetes flaccida*)
S1 ....Louisiana quillwort (*Isoetes louisianensis*)
S1 ....Blackfoot quillwort (*Isoetes melanopoda*)
S2 ....Piedmont quillwort (*Isoetes piedmontana*)
S2 ....Riddell's spikemoss (*Selaginella arenicola ssp. riddellii*)
S1S2 ....Gulf spike-moss (*Selaginella ludoviciana*)
S2 ....Shining clubmoss (*Huperzia lucidula*)
S1 ....Rock clubmoss (*Huperzia porophila*)
S1S2 ....Nodding clubmoss (*Lycopodiella cernua*)
S1 ....Tree clubmoss (*Lycopodium obscurum*)
S1 ....Deep-root clubmoss (*Lycopodium tristachyum*)
S1 ....Whiskfern (*Psilotum nudum*)
S2 ....Feid horsetail (*Equisetum arvense*)

E.2.2. S1 and S2 Species in Mississippi

E.2.2.1. Mammals

S1 ....Black bear (*Ursus americanus*)
S1 ....Louisiana black bear (*Ursus americanus luteolus*)
S1 ....Meadow jumping mouse (*Zapus hudsonius*)

E.2.2.2. Birds

Due to the migratory nature of birds, additional ranking systems from The Nature Conservancy are applied here. "SB are regularly occurring migratory and present only during the breeding season." "SN are regularly occurring, usually migratory and typically non-breeding species in the state; this category includes migratory birds, bats, sea turtles, and cetaceans which do not breed in the state but pass through twice a year or may remain in winter."

S1N .... Golden eagle (*Aquila chrysaetos*)
S2B......... Swallow-tailed kite (*Elanoides forficatus*)
S1BS2N . Bald eagle (*Haliaeetus leucocephalus*)
S1 .... Mississippi sandhill crane (*Grus canadensis pulla*)
S2N .... Yellow rail (*Coturnicops noveboracensis*)
S2N .... Black rail (*Laterallus jamaicensis*)
S2N .... American white pelican (*Pelecanus erythrorhynchos*)
S1N .... Brown pelican (*Pelecanus occidentalis*)
S1 .... Red-cockaded woodpecker (*Picoides borealis*)
S1N .... Burrowing owl (*Athene cunicularia*)

E.2.2.3. Reptiles

S2 .... Mimic glass lizard (*Ophisaurus mimicus*)
S1 .... Eastern indigo snake (*Drymarchon corais couperi*)
S2 .... Rainbow snake (*Farancia erytrogramma*)
S2 .... Black pine snake (*Pituophis melanoleucus lodingi*)
S1N .... Kemp's or atlantic ridley (*Lepidochelys kempii*)
S2 .... Yellow-blotched map turtle (*Graptemys flavimaculata*)
S2 .... Black-knobbed map turtle (*Graptemys nigrinoda*)
S2 .... Ringed map turtle (*Graptemys oculifera*)
S2 .... Mississippi diamondback terrapin (*Malaclemys terrapin pileata*)
S1 .... Mississippi redbelly turtle (*Pseudemys pop 1*)
S2 .... Gopher tortoise (*Gopherus polyphemus*)

E.2.2.4. Amphibians

S1 .... River frog (*Rana heckscheri*)
S1 .... Dark gopher frog (*Rana sevosa*)
S1 .... Tiger salamander (*Ambystoma tigrinum*)
S1 .... One-toed amphiuma (*Amphiuma pholeter*)
S1 .... Hellbender (*Cryptobranchus alleganiensis*)
S1 .... Green salamander (*Aneides aeneus*)
S1 .... Cave salamander (*Eurycea lucifuga*)
S1 .... Spring salamander (*Gyrinophilus porphyriticus*)
S1S2 .... Four-toed salamander (*Hemidactylium scutatum*)
S2 .... Southern zigzag salamander (*Plethodon ventralis*)

E.2.2.5. Snails

S1 .... Big Black Rocksnail (*Lithasia hubrichti*)

E.2.2.6. Mussels

S1 .... Mucket (*Actinonaias ligamentina*)
S2 .... Rayed creekshell (*Anodontoides radiatus*)
S2 .... Rock pocketbook (*Arcidens confragosus*)
S1 .... Purple wartyback (*Cyclonaias tuberculata*)

S1 .... Delicate spike (*Elliptio arctata*)
S1 .... Spike (*Elliptio dilatata*)
S1 .... Cumberlandian combshell (*Epioblasma brevidens*)
S1 .... Southern combshell (*Epioblasma penita*)
S1 .... Snuffbox (*Epioblasma triquetra*)
S1 .... Tennessee pigtoe (*Fusconaia barnesiana*)
S1 .... Orange-nacre mucket (*Lampsilis perovalis*)
S1 .... Slabside pearlymussel (*Lexingtonia dolabelloides*)
S2 .... Black sandshell (*Ligumia recta*)
S1 .... Alabama moccasinshell (*Medionidus acutissimus*)
S2 .... Southern hickorynut (*Obovaria jacksoniana*)
S2 .... Round hickorynut (*Obovaria subrotunda*)
S1 .... Sheepnose (*Plethobasus cyphyus*)
S1S2 .... Southern clubshell (*Pleurobema decisum*)
S1 .... Ovate clubshell (*Pleurobema perovatum*)
S1 .... Pyramid pigtoe (*Pleurobema rubrum*)
S2 .... Pink heelsplitter (*Potamilus alatus*)
S1 .... Fat pocketbook (*Potamilus capax*)
S1 .... Kidneyshell (*Ptychobranchus fasciolaris*)
S1 .... Rabbitsfoot (*Quadrula cylindrica cylindrica*)
S2 .... Ridged mapleleaf (*Quadrula rumphiana*)
S1 .... Alabama creekmussel (*Strophitus connasaugaensis*)
S2 .... Southern creekmussel *Strophitus subvexus*)
S2 .... Tapered pondhorn (*Uniomerus declivis*)

E.2.2.7. Crustaceans

S2 .... Least crayfish (*Cambarellus diminutus*)
S2 .... A crayfish (*Cambarellus lesliei*)
S2 .... A crayfish (*Cambarus girardianus*)
S2 .... Burris' burrowing crawfish (*Fallicambarus burrisi*)
S2 .... Speckled burrowing crayfish (*Fallicambarus danielae*)
S1 .... Camp Shelby burrowing crawfish (*Fallicambarus gordoni*)
S2 .... Pearl rivulet crayfish (*Hobbseus attenuatus*)
S1 .... Oktibbeha rivulet crayfish (*Hobbseus orconectoides*)
S2 .... Tombigbee rivulet crayfish (*Hobbseus petilus*)
S1 .... Choctaw rivulet crayfish (*Hobbseus valleculus*)
S2 .... A crayfish (*Orconectes hartfieldi*)
S2 .... Jackson Prairie crayfish (*Procambarus barbiger*)
S1 .... Mississippi flatwoods crayfish (*Procambarus cometes*)
S2 .... Spiny-tailed crayfish (*Procambarus fitzpatricki*)
S1 .... Lagniappe crayfish (*Procambarus lagniappe*)
S2 .... Mobile crayfish (*Procambarus lecontei*)
S2 .... Shutispear crayfish (*Procambarus lylei*)
S1 .... Bearded red crayfish (*Procambarus pogum*)

E.2.2.8. Fish

S1 .... Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
S1 .... Pallid sturgeon (*Scaphirhynchus albus*)
S1 .... Alabama sturgeon (*Scaphirhynchus suttkusi*)

S2 ....Broadstripe topminnow (*Fundulus euryzonus*)
S1 ....Alabama shad (*Alosa alabamae*)
S1 ....Silver redhorse (*Moxostoma anisurum*)
S1 ....Black redhorse (*Moxostoma duquesnei*)
S1 ....Shorthead redhorse (*Moxostoma macrolepidotum*)
S2 ....Rosyside dace (*Clinostomus funduloides*)
S2 ....Alabama shiner (*Cyprinella callistia*)
S2 ....Spotfin shiner (*Cyprinella spiloptera*)
S2 ....Rosefin shiner (*Lythrurus fasciolaris*)
S1 ....Bigeye shiner (*Notropis boops*)
S2 ....Silverside shiner (*Notropis candidus*)
S2 ....Ironcolor shiner (*Notropis chalybaeus*)
S1 ....Fluvial shiner (*Notropis edwardraneyi*)
S1S2 ....Blackmouth shiner (*Notropis melanostomus*)
S1 ....Rosyface shiner (*Notropis rubellus*)
S1 ....Suckermouth minnow (*Phenacobius mirabilis*)
S2 ....Southern redbelly dace (*Phoxinus erythrogaster*)
S1 ....Blacknose dace (*Rhinichthys atratulus*)
S2 ....Alligator gar (*Atractosteus spatula*)
S1 ....Rock bass (*Ambloplites rupestris*)
S1 ....Western sand darter (*Ammocrypta clara*)
S1 ....Crystal darter (*Crystallaria asprella*)
S1 ....Black darter (*Etheostoma duryi*)
S2 ....Fantail darter (*Etheostoma flabellare*)
S2 ....Stripetail darter (*Etheostoma kennicotti*)
S2 ....Blackfin darter (*Etheostoma nigripinne*)
S2 ....Yazoo darter (*Etheostoma raneyi*)
S1 ....Bayou darter (*Etheostoma rubrum*)
S2 ....Redline darter (*Etheostoma rufilineatum*)
S1 ....Backwater darter (*Etheostoma zonifer*)
S2 ....Bandfin darter (*Etheostoma zonistium*)
S1 ....Pearl darter (*Percina aurora*)
S1 ....Gilt darter (*Percina evides*)
S2 ....Freckled darter (*Percina lenticula*)
S1 ....Slenderhead darter (*Percina phoxocephala*)
S1 ....Banded sculpin (*Cottus carolinae*)
S1 ....Slender madtom (*Noturus exilis*)
S2 ....Frecklebelly madtom (*Noturus munitus*)
S1 ....Northern madtom (*Noturus stigmosus*)

E.2.2.9. Plants

S2 ....Atlantic white cedar (*Chamaecyparis thyoides*)
S2 ....Southern red cedar (*Juniperus silicicola*)
S1 ....Sand pine (*Pinus clausa*)
S2 ....Virginia pine (*Pinus virginiana*)
S2 ....San antonio false-foxglove (*Agalinis homalantha*)
S2 ....Shinners’ false-foxglove (*Agalinis pseudaphylla*)
S1 ....Pale false foxglove (*Agalinis skinneriana*)
S1S2 ....Wood anemone (*Anemone quinquefolia*)
S1 ....Price’s potato bean (*Apios priceana*)

S1S2 ....Wild columbine (*Aquilegia canadensis*)
S1 ....Spreading rockcress (*Arabis patens*)
S1S2 ....Lake cress (*Armoracia aquatica*)
S2 ....Prairie milkweed (*Asclepias hirtella*)
S1 ....Purple milkweed (*Asclepias purpurascens*)
S2 ....White heath aster (*Aster ericoides*)
S1 ....Barrens silky aster (*Aster pratensis*)
S1 ....Purple-stemmed aster (*Aster puniceus*)
S2 ....Rattle-vetch (*Astragalus canadensis*)
S1 ....Engelman’’s bent milk-vetch (*Astragalus distortus var. engelmannii*)
S1 ....Great indian-plantain (*Cacalia muehlenbergii*)
S1S2 ....Clustered poppy-mallow (*Callirhoe triangulata*)
S1 ....Scarlet indian-paintbrush (*Castilleja coccinea*)
S1 ....Florida senna (*Chamaecrista deeringiana*)
S1 ....Pink turtlehead (*Chelone lyonii*)
S2 ....Spotted wintergreen (*Chimaphila maculata*)
S1S2 ....Black bugbane (*Cimicifuga racemosa*)
S2 ....Yellowwood (*Cladrastis kentukea*)
S1 ....Vase-vine leather-flower (*Clematis beadlei*)
S1 ....White-leaved leather-flower (*Clematis glaucophylla*)
S1 ....Seaside balm (*Conradina canescens*)
S1S2 ....Georgia tickseed (*Coreopsis nudata*)
S2 ....Alternate-leaf dogwood (*Cornus alternifolia*)
S1 ....Ashe hawthorn (*Crataegus ashei*)
S1 ....Gallion hawthorn (*Crataegus meridionalis*)
S1 ....Three-flowered hawthorn (*Crataegus triflora*)
S2 ....Dwarf larkspur (*Delphinium tricorne*)
S1S2 ....Pepper-root (*Dentaria diphylla*)
S1 ....Creamflower tick-trefoil (*Desmodium ochroleucum*)
S1 ....Dutchman’s breeches (*Dicentra cucullaria*)
S2 ....Eastern leatherwood (*Dirca palustris*)
S2 ....Shootingstar (*Dodecatheon meadia*)
S1S2 ....American dragonhead (*Dracocephalum parviflorum*)
S1 ....Marsh eryngo (*Eryngium aquaticum*)
S1S2 ....Hooker’s eryngo (*Eryngium hookeri*)
S1 ....Tall prairie-gentain (*Eustoma exaltatum*)
S1 ....Bighead pygmycudweed (*Evax prolifera*)
S1 ....Upland swamp privet (*Forestiera ligustrina*)
S2 ....Blue ash (*Fraxinus quadrangulata*)
S1 ....Sticky hedge-hyssop (*Gratiola brevifolia*)
S2 ....Kentucky coffee-tree (*Gymnocladus dioicus*)
S1 ....Drummond pennyroyal (*Hedeoma drummondii*)
S1S2 ....Gulf rockrose (*Helianthemum arenicola*)
S1 ....Giant alumroot (*Heuchera villosa var. macrorhiza*)
S1 ....Large-flowered heartleaf (*Hexastylis shuttleworthii*)
S2 ....Brillant hibiscus (*Hibiscus coccineus*)
S1 ....Rattlesnake hawkweed (*Hieracium venosum*)
S1S2 ....Featherfoil (*Hottonia inflata*)
S2 ....Green violet (*Hybanthus concolor*)
S1 ....Golden seal (*Hydrastis canadensis*)
S1 ....Appendaged waterleaf (*Hydrophyllum appendiculatum*)

S1	Large-leaf waterleaf (*Hydrophyllum macrophyllum*)
S2	Myrtle-leaved st. Johnswort (*Hypericum myrtifolium*)
S2	Dahoon holly (*Ilex cassine*)
S2	White walnut (*Juglans cinerea*)
S2	Spreading bladder-pod (*Lesquerella gracilis*)
S1S2	Nondo lovage (*Ligusticum canadense*)
S2	Pondberry (*Lindera melissifolia*)
S2	Bog spice bush (*Lindera subcoriacea*)
S2	Large fruited flax (*Linum macrocarpum*)
S1	Boykin’s lobelia (*Lobelia boykinii*)
S1	Sessile-leaved bugleweed (*Lycopus amplectens*)
S1S2	Umbrella magnolia (*Magnolia tripetala*)
S1S2	Virginia bluebells (*Mertensia virginica*)
S1S2	Square-stem monkey flower (*Mimulus ringens*)
S1	Narrowleaf miterwort (*Mitreola angustifolium*)
S1	Loose watermilfoil (*Myriophyllum laxum*)
S1S2	Nestronia (*Nestronia umbellula*)
S1	Alabama snow-wreath (*Neviusia alabamensis*)
S1S2	Floating-heart (*Nymphoides cordata*)
S1	Large-flowered evening-primrose (*Oenothera grandiflora*)
S1	Small palafoxia (*Palafoxia callosa*)
S2	Large-leaved grass-of-parnassus (*Parnassia grandifolia*)
S1S2	Beach sand-squares (*Paronychia erecta*)
S1S2	Eastern eulophus (*Perideridia americana*)
S1	Fernleaf phacelia (*Phacelia bipinnatifida*)
S1S2	Sandhill bean (*Phaseolus sinuatus*)
S1	Hairy mock-orange (*Philadelphus hirsutus*)
S2	Odorless mock-orange (*Philadelphus inodorus*)
S1	Carpenter’s ground-cherry (*Physalis carpenteri*)
S1	Climbing fetter-bush (*Pieris phillyreifolia*)
S2	Chapman’s butterwort (*Pinguicula planifolia*)
S1	Heartleaf plantain (*Plantago cordata*)
S1S2	Slender-leaf clammy-weed (*Polanisia tenuifolia*)
S1S2	Hooker’s milkwort (*Polygala hookeri*)
S1	Georgia milkwort (*Polygala leptostachys*)
S2	Prairie parsley (*Polytaenia nuttallii*)
S2	Rough rattlesnake-root (*Prenanthes aspera*)
S1	Awned mountain-mint (*Pycnanthemum setosum*)
S2	Bur oak (*Quercus macrocarpa*)
S1	Dwarf live oak (*Quercus minima*)
S2	Lance-leaved buckthorn (*Rhamnus lanceolata*)
S1	Smooth azalea (*Rhododendron arborescens*)
S1	Rough coneflower (*Rudbeckia grandiflora*)
S1	Sweet coneflower (*Rudbeckia subtomentosa*)
S2	Night-flowering ruellia (*Ruellia noctiflora*)
S2	Tiny-leaved buckthorn (*Sageretia minutiflora*)
S1S2	Flordia soapberry (*Sapindus marginatus*)
S1	Rose pitcherplant (*Sarracenia rosea*)
S1	Wherry’s pitcher-plant (*Sarracenia rubra ssp. wherryi*)
S1	Rock stonecrop (*Sedum pulchellum*)
S2	Wood stonecrop (*Sedum ternatum*)

S1S2 .... Ovate catchfly (*Silene ovata*)
S1 .... Eared goldenrod (*Solidago auriculata*)
S1S2 .... Appalachian goldenrod (*Solidago flaccidifolia*)
S1S2 .... False goldenrod (*Solidago sphacelata*)
S1 .... Mountain camellia (*Stewartia ovata*)
S1 .... Water southern morning-glory (*Stylisma aquatica*)
S1 .... Patterson’s bindweed (*Stylisma pickeringii var. pattersonii*)
S1 .... Yellow pimpernell (*Taenidia integerrima*)
S1S2 .... Southern meadow-rue (*Thalictrum debile*)
S1 .... Stiff greenthreads (*Thelesperma filifolium*)
S2 .... Heart-leaved foam-flower (*Tiarella cordifolia*)
S1 .... Earleaf false-foxglove (*Tomanthera auriculata*)
S1 .... Carolina tassel-rue (*Trautvetteria caroliniensis*)
S1 .... Piedmont bladderwort (*Utricularia olivacea*)
S2 .... Gale-leaf blueberry (*Vaccinium tenellum*)
S1 .... Maple-leaf viburnum (*Viburnum acerifolium*)
S1S2 .... Smooth yellow violet (*Viola pubescens var. eriocarpon*)
S1 .... Green-flower yeatesia (*Yeatesia viridiflora*)
S1 .... Pinewoods-lily (*Alophia drummondii*)
S1 .... Puttyroot (*Aplectrum hyemale*)
S1 .... Southern three-awned grass (*Aristida simpliciflora*)
S1 .... Many-flower grass-pink (*Calopogon multiflorus*)
S1 .... Oklahoma grass-pink (*Calopogon oklahomensis*)
S1 .... Golden canna (*Canna flaccida*)
S1 .... Baltzell’s sedge (*Carex baltzellii*)
S1 .... Bristly sedge (*Carex comosa*)
S2 .... Coast sedge (*Carex exilis*)
S1 .... Southern few-fruited sedge (*Carex impressinervia*)
S1S2 .... Nebraska sedge (*Carex jamesii*)
S1 .... Loose-flowered sedg (*Carex laxiflora var. laxiflora*)
S1 .... Eastern few-fruit sedge (*Carex oligocarpa*)
S1 .... Drooping sedge (*Carex prasina*)
S1S2 .... Separated sedg e (*Carex seorsa*)
S1S2 .... Walter’s sedg e (*Carex striata*)
S2 .... Uptight sedge (*Carex stricta*)
S1 .... Twig rush (*Cladium mariscoides*)
S1 .... Pitted jointgrass (*Coelorachis cylindrical*)
S1 .... Small yellow lady’s-slipper (*Cypripedium parviflorum*)
S1S2 .... Wright’s witchgrass (*Dichanthelium wrightianum*)
S1 .... Erect burhead (*Echinodorus rostratus*)
S1 .... Dwarf burhead (*Echinodorus tenellus var. parvulus*)
S1 .... Slim spike-rush (*Eleocharis elongate*)
S1 .... Black-fruited spike-rush (*Eleocharis melanocarpa*)
S2 .... Robbins spikerush (*Eleocharis robbinsii*)
S1 .... Beaked spikerush (*Eleocharis rostellata*)
S2 .... Green-fly orchid (*Epidendrum conopseum*)
S2 .... White dog’s tooth violet (*Erythronium albidum*)
S1S2 .... Yellow dog’s tooth violet (*Erythronium americanum*)
S1S2 .... Beaked dog’s tooth violet (*Erythronium rostratum*)
S1S2 .... Smooth-lipped eulophia (*Eulophia ecristata*)
S1 .... Downy rattlesnake-plantain (*Goodyera pubescens*)

S1 ....Engelmann’s sea-grass (*Halophila engelmannii*)
S2 ....Herbertia (*Herbertia lahue ssp. caerulea*)
S2 ....Crested coralroot (*Hexalectris spicata*)
S2 ....Pineland bogbutton (*Lachnocaulon digynum*)
S1S2 ....Michigan lily (*Lilium michiganense*)
S1S2 ....Slender muhly (*Muhlenbergia tenuiflora*)
S2 ....Prairie-iris (*Nemastylis geminiflora*)
S1 ....Showy orchis (*Orchis spectabilis*)
S2 ....Naked-stemmed panic grass (*Panicum nudicaule*)
S2 ....Large white fringed orchid (*Platanthera blephariglottis*)
S1 ....White fringeless orchid (*Platanthera integrilabia*)
S1S2 ....Green fringed-orchid (*Platanthera lacera*)
S1 ....Creekgrass (*Potamogeton epihydrus*)
S1 ....Hairy-peduncled beak-rush (*Rhynchospora crinipes*)
S1 ....Curtiss’s beakrush (*Rhynchospora curtissii*)
S1 ....Swamp-forest beakrush (*Rhynchospora decurrens*)
S1 ....Fernald’s beakrush (*Rhynchospora fernaldii*)
S1 ....Small’s beakrush (*Rhynchospora globularis var. pinetorum*)
S1 ....Harper beakrush (*Rhynchospora harperi*)
S1 ....Thorne’s beakrush (*Rhynchospora thornei*)
S1 ....Tracy’s beakrush (*Rhynchospora tracyi*)
S1 ....Slender arrow-head (*Sagittaria isoetiformis*)
S1 ....Spring-tape arrowhead (*Sagittaria kurziana*)
S1 ....Reticulated nutrush (*Scleria reticularis*)
S1 ....Florida ladies’-tresses (*Spiranthes brevilabris var. floridana*)
S1S2 ....Eastern featherbells (*Stenanthium gramineum*)
S1 ....Powdery thalia (*Thalia dealbata*)
S1 ....Palmer’s spiderwort (*Tradescantia ernestiana*)
S1 ....Drooping trillium (*Trillium flexipes*)
S1 ....Dwarf trillium (*Trillium pusillum*)
S1 ....Southern bellwort (*Uvularia floridana*)
S2 ....Drummond’s yellow-eyed grass (*Xyris drummondii*)
S1S2 ....Harper’s yellow-eyed grass (*Xyris scabrifolia*)

E.2.2.10. Ferns and Allies

S1S2 ....Field horsetail (*Equisetum arvense*)
S2 ....Southern maidenhair-fern (*Adiantum capillus-veneris*)
S1 ....Lobed spleenwort (*Asplenium pinnatifidum*)
S1 ....Black-stem spleenwort (*Asplenium resiliens*)
S1S2 ....Walking-fern spleenwort (*Asplenium rhizophyllum*)
S1 ....Maidenhair spleenwort (*Asplenium trichomanes*)
S2S3 ....Glade fern (*Athyrium pycnocarpon*)
S2S3 ....Silvery spleenwort (*Athyrium thelypterioides*)
S1 ....Alabama lipfern (*Cheilanthes alabamensis*)
S2 ....Hairy lipfern (*Cheilanthes lanosa*)
S1 ....Southern shield wood-fern (*Dryopteris ludoviciana*)
S1 ....Southern wood fern (*Dryopteris x australis*)
S1S2 ....Hairy water-fern (*Marsilea mucronata*)
S1S2 ....Purple-stem cliff-brake (*Pellaea atropurpurea*)
S1 ....Bristle-fern (*Trichomanes boschianum*)

S1 ....Dwarf filmy-fern (*Trichomanes petersii*)
S1S2 ....Appalachian quillwort (*Isoetes engelmannii*)
S2 ....Louisiana quillwort (*Isoetes louisianensis*)
S2 ....Blackfoot quillwort (*Isoetes melanopoda*)
S2 ....Nodding clubmoss (*Lycopodium cernuum*)
S1 ....Limestone adder’s-tongue (*Ophioglossum engelmannii*)

APPENDIX F—SOILS

SOILS WITHIN ALABAMA AND MISSISSIPPI BLM-ADMINISTERED NON-U.S. FOREST SERVICE FEDERAL MINERAL OWNERSHIP

Tables F-1 and F-2 provide erosion potential and prime farmland information for areas in Alabama and Mississippi BLM-administered non-U.S. Forest Service Federal Mineral Ownership (non-USFS FMO) that are considered high potential for either oil and gas or coal exploration and development. Data are available in spatial format.

Table F-1. Soils Descriptions for Areas Within Alabama Non-USFS FMO

County	Soil Description	Erosion Potential [1]	Prime Farmland [1]
Baldwin	Coastal beaches	None	No
Baldwin	Leon sand	Slight	No
Baldwin	St. Lucie–Leon–Muck complex	Slight	No
Cherokee	Allen fine sandy loam, 2 to 6 percent slopes	Slight to Moderate	Yes
Cherokee	Hartsells fine sandy loam, 2 to 6 percent slopes	Slight to Moderate	Yes
Cherokee	Hartsells fine sandy loam, 6 to 10 percent slopes	Moderate	No
Cherokee	Hartsells-rock outcrop association, steep	Very Severe	No
Cherokee	Hector-Hartsells-rock outcrop complex, 2 to 10 percent slopes (Gorgas-Hartsells-rock outcrop)	Moderate	No
Cherokee	Linker fine sandy loam, 6 to 10 percent slopes	Slight to Moderate	No
Cherokee	Toccoa soils	Slight	No
DeKalb	Crossville rocky loam, rolling	Unavailable	No
DeKalb	Hartsells fine sandy loam, eroded, rolling	Moderate	No
DeKalb	Hartsells fine sandy loam, eroded, rolling, shallow	Moderate	No
DeKalb	Hartsells fine sandy loam, eroded, undulating	Slight to Moderate	Yes
DeKalb	Hartsells fine sandy loam, eroded, undulating, shallow	Slight to Moderate	No
DeKalb	Hartsells fine sandy loam, rolling, shallow	Moderate	No
DeKalb	Muskingum stony fine sandy loam, hilly	Very Severe	No
DeKalb	Muskingum stony fine sandy loam, rolling	Very Severe	No
DeKalb	Philo loam	Slight	Yes
DeKalb	Rockland, sandstone, rolling	Very Severe	No
DeKalb	Rockland, sandstone, steep	Very Severe	No
Fayette	Barfield-Rock outcrop complex, steep	Very Severe	No
Fayette	Gorgas-rock outcrop complex, 8 to 15 percent slopes	Very Severe	No
Fayette	Hanceville fine sandy loam, 8 to 15 percent slopes	Severe	No
Fayette	Hanceville-Urban land complex, 2 to 8 percent slopes	Slight to Moderate	No

County	Soil Description	Erosion Potential [1]	Prime Farmland [1]
Fayette	Holston-urban land complex, 2 to 8 percent slopes	Unavailable	No
Fayette	Nauvoo and Nectar fine sandy loams, 2 to 6 percent slopes	Slight to Moderate	Yes
Fayette	Nauvoo-Urban land complex, 8 to 15 percent slopes	Unavailable	No
Fayette	Sunlight-Sipsey complex, 15 to 40 percent slopes	Very Severe	No
Fayette	Sunlight-Townley complex, 15 to 45 percent slopes	Very Severe	No
Jefferson	Docena complex, 0 to 4 percent slopes	Slight	No
Jefferson	Hanceville fine sandy loam, 8 to 15 percent slopes	Severe	No
Jefferson	Hanceville-urban land complex, 2 to 8 percent slopes	Slight to Moderate	No
Jefferson	Montevallo-Nauvoo association, steep	Very Severe	No
Jefferson	Nauvoo fine sandy loam, 8 to 15 percent slopes	Unavailable	No
Jefferson	Palmerdale complex, steep	Unavailable	No
Jefferson	Sullivan-state complex, 0 to 2 percent slopes	Slight	Yes
Jefferson	Townley-Nauvoo complex, 8 to 15 percent slopes	Severe	No
Mobile	Pactolus loamy sand, 0 to 2 percent slopes	Moderate	No
Shelby	Allen loam, 2 to 6 percent slopes	Slight to Moderate	Yes
Shelby	Allen loam, 6 to 10 percent slopes	Moderate	No
Shelby	Allen-Quitman-urban land complex, 0 to 10 percent slopes	Slight to Moderate	No
Shelby	Choccolocco loam, occasionally flooded	Slight	Yes
Shelby	Choccolocco-Sterrett association, frequently flooded	Slight	No
Shelby	Decatur silt loam, 2 to 6 percent slopes	Slight to Moderate	Yes
Shelby	Decatur silt loam, 6 to 10 percent slopes	Moderate	No
Shelby	Etowah silt loam, 6 to 10 percent slopes	Moderate	No
Shelby	Minvale-Fullerton complex, 6 to 15 percent slopes	Severe	No
Shelby	Nauvoo-Sunlight complex, 15 to 25 percent slopes	Severe	No
Shelby	Nella-Mountainburg association, steep	Very Severe	No
Shelby	Quitman loam, 0 to 4 percent slopes	Slight to Moderate	Yes
Shelby	Sterrett silt loam	Slight	No
Shelby	Townley silt loam, 12 to 18 percent slopes	Very Severe	No
Shelby	Townley silt loam, 4 to 12 percent slopes	Severe	No
Shelby	Townley-Sunlight complex, 12 to 35 percent slopes	Very Severe	No
Shelby	Tupelo loam, frequently flooded	Unavailable	No
Tuscaloosa	Adaton silt loam	Slight	No
Tuscaloosa	Augusta-Amy complex, frequently flooded	Slight	No
Tuscaloosa	Bama fine sandy loam, 0 to 2 percent slopes	Slight	Yes
Tuscaloosa	Bama fine sandy loam, 2 to 6 percent slopes	Slight to Moderate	Yes
Tuscaloosa	Boswell loam, 4 to 10 percent slopes	Severe	No
Tuscaloosa	Choccolocco silt loam	Slight	Yes

County	Soil Description	Erosion Potential [1]	Prime Farmland [1]
Tuscaloosa	Ellisville silt loam, frequently flooded	Slight	No
Tuscaloosa	Falkner silt loam	Slight	Yes
Tuscaloosa	Iuka-Mantachie complex, frequently flooded	Slight	No
Tuscaloosa	Luverne-Smithdale complex, 4 to 10 percent slopes	Severe	No
Tuscaloosa	Montevallo-Nauvoo association, steep	Very Severe	No
Tuscaloosa	Montevallo-Nauvoo complex, 15 to 45 percent slopes	Very Severe	No
Tuscaloosa	Nauvoo fine sandy loam, 4 to 10 percent slopes	Moderate	No
Tuscaloosa	Palmerdale very gravelly loam, 6 to 45 percent slopes	Very Severe	No
Tuscaloosa	Palmerdale very shaly loam, 6 to 45 percent slopes	Very Severe	No
Tuscaloosa	Ruston fine sandy loam, 0 to 2 percent slopes	Slight	Yes
Tuscaloosa	Ruston fine sandy loam, 2 to 6 percent slopes	Slight	Yes
Tuscaloosa	Shatta silt loam, 0 to 2 percent slopes	Slight	Yes
Tuscaloosa	Shatta silt loam, 2 to 6 percent slopes	Slight to Moderate	Yes
Tuscaloosa	Smithdale association, hilly	Very Severe	No
Tuscaloosa	Smithdale fine sandy loam, 15 to 35 percent slopes	Very Severe	No
Tuscaloosa	Smithdale fine sandy loam, 6 to 15 percent slopes	Severe	No
Tuscaloosa	Smithdale-Flomaton complex, 15 to 35 percent slopes	Very Severe	No
Tuscaloosa	Smithdale-Luverne association, hilly	Severe	No
Tuscaloosa	Smithdale-Luverne complex, 15 to 35 percent slopes	Very Severe	No
Tuscaloosa	Smithdale-Pikeville association, hilly	Very Severe	No
Walker	Brilliant and Palmerdale extremely channery loams, 6 to 60 percent slopes	Very Severe	No
Walker	Hanceville fine sandy loam, 8 to 15 percent slopes	Severe	No
Walker	Izagora-Annemaine association, moderately undulating	Unavailable	No
Walker	Montevallo channery silt loam, 30 to 60 percent slopes	Very Severe	No
Walker	Nauvoo and Nectar fine sandy loams, 2 to 6 percent slopes	Slight to Moderate	Yes
Walker	Nauvoo and Sipsey soils, 6 to 12 percent slopes	Severe	No
Walker	Nauvoo-Townley complex, 4 to 20 percent slopes	Very Severe	No
Walker	Sipsey-Bankhead complex, 15 to 45 percent slopes	Very Severe	No
Walker	Spadra-Whitwell complex, 0 to 3 percent slopes, occasionally flooded	Unavailable	Yes
Walker	Sunlight-Sipsey complex, 15 to 40 percent slopes	Very Severe	No
Walker	Sunlight-Townley complex, 15 to 45 percent slopes	Very Severe	No
Walker	Townley silt loam, 2 to 6 percent slopes	Moderate	No
Walker	Townley silt loam, 6 to 15 percent slopes	Very Severe	No

1 Erosion potential and prime farmland classification data collected from NRCS Soil Data Mart (http://soildatamart.nrcs.usda.gov/).

Table F-2. Soils Descriptions for Areas Within Mississippi Non-USFS FMO

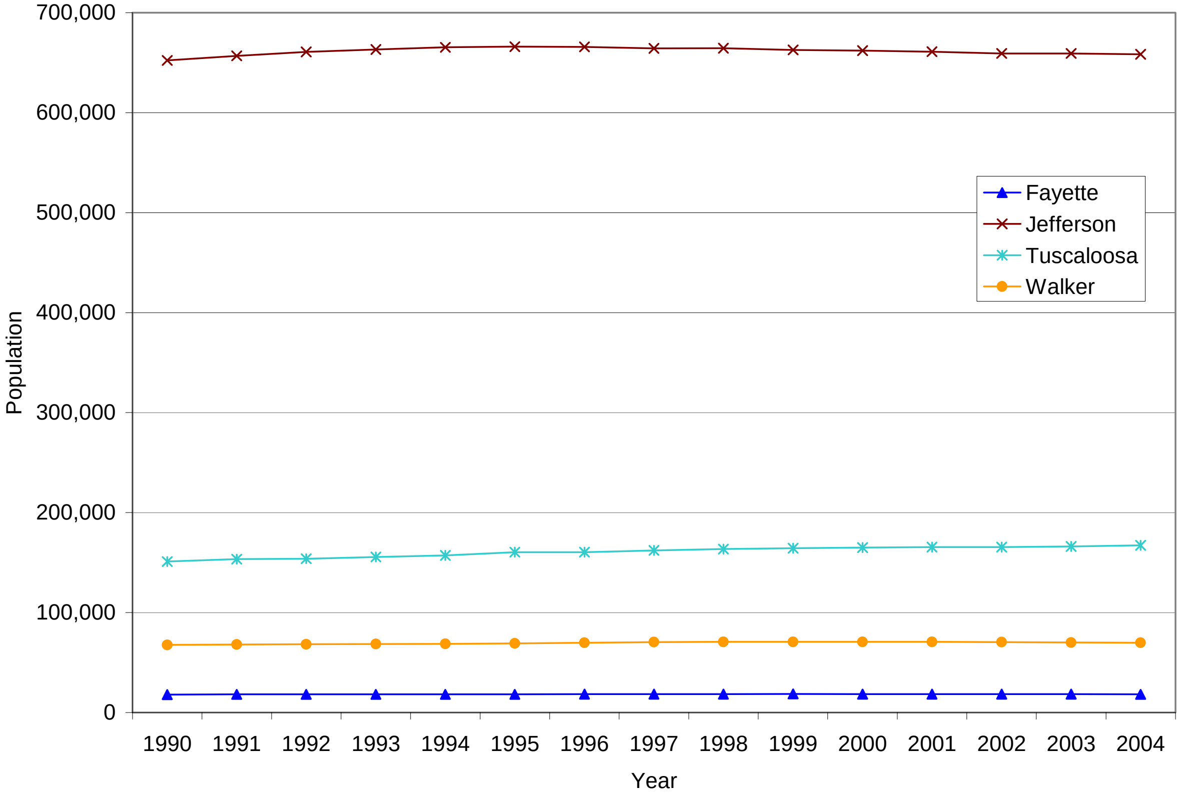
County	Soil Description	Erosion Potential [1]	Prime Farmland
Forrest	Bassfield fine sandy loam, 0 to 2 percent slopes	Low to Moderate	Yes
Forrest	Benndale fine sandy loam, 2 to 5 percent slopes	Low to Moderate	Yes
Forrest	Benndale fine sandy loam, 5 to 8 percent slopes	Low to Moderate	Yes
Forrest	Cahaba sandy loam, 0 to 2 percent slopes	Moderate	Yes
Forrest	Malbis loam, 2 to 5 percent slopes	Moderate	Yes
Forrest	McGauran loamy sand, 2 to 5 percent slopes	Low	Yes
Forrest	Poarch fine sandy loam, 2 to 5 percent slopes	Low to Moderate	Yes
Forrest	Poarch fine sandy loam, 5 to 8 percent slopes	Low to Moderate	Yes
Forrest	Prentiss loam, 0 to 2 percent slopes	Moderate	Yes
Forrest	Prentiss loam, 2 to 5 percent slopes	Moderate	Yes
Forrest	Bassfield urban land complex, occasionally flooded	Unavailable	No
Forrest	Benndale fine sandy loam, 8 to 12 percent slopes	Low to Moderate	No
Forrest	Bibb silt loam	Moderate	No
Forrest	Bibb and Jena soils, frequently flooded	Moderate	No
Forrest	Cadeville variant silt loam, 15 to 60 percent slopes	Moderate to High	No
Forrest	Faulkner-Susquehanna urban land complex, 2 to 5 percent slopes	Moderate	No
Forrest	Heidel sandy loam, 12 to 30 percent slopes	Low to Moderate	No
Forrest	Jena-Nugent association, frequently flooded	Low	No
Forrest	McLaurin loamy sand, 5 to 8 percent slopes	Low	No
Forrest	McLaurin-Benndale association, rolling	Moderate	No
Forrest	Pamlico-Dorovan association	Low	No
Forrest	Petal-Susquehanna-Benndale association, rolling	Moderate	No
Forrest	Pits	Moderate	No
Forrest	Poarch-Saucier association, undulating	Moderate	No
Forrest	Prentiss urban land complex	Moderate	No
Forrest	Susquehanna silt loam, 5 to 12 percent slopes	Moderate	No
Forrest	Troup loamy fine sand, 0 to 8 percent slopes	Low	No

1 Erosion potential was estimated based on K factors (susceptibility of a soil to sheet and rill erosion by water) provided by the NRCS. Erosion hazard estimation as provided for Alabama were not available for Mississippi.

APPENDIX G—SOCIOECONOMIC FIGURES

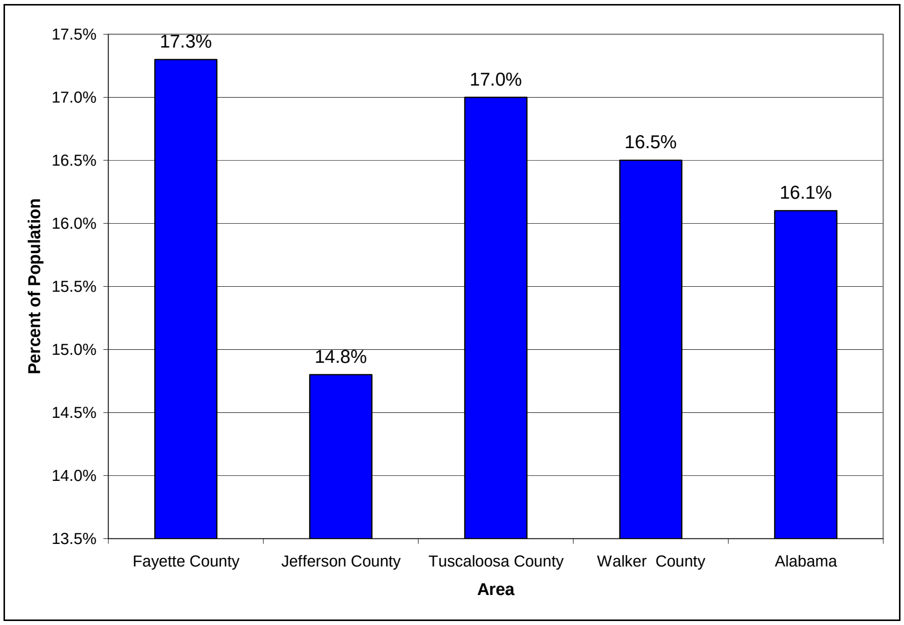
The following figures represent socioeconomic trends for the Bureau of Land Management (BLM) administered non-U.S. Forest Service Federal Mineral Ownership (non-USFS FMO) study areas in Mississippi and Alabama. Socioeconomic study areas for non-USFS FMO were developed for areas with high potential for mineral development as discussed in Chapter 3.

Figure G-1. Population Trends for BLM Non-USFS FMO Study Area in Alabama (1990-2002)



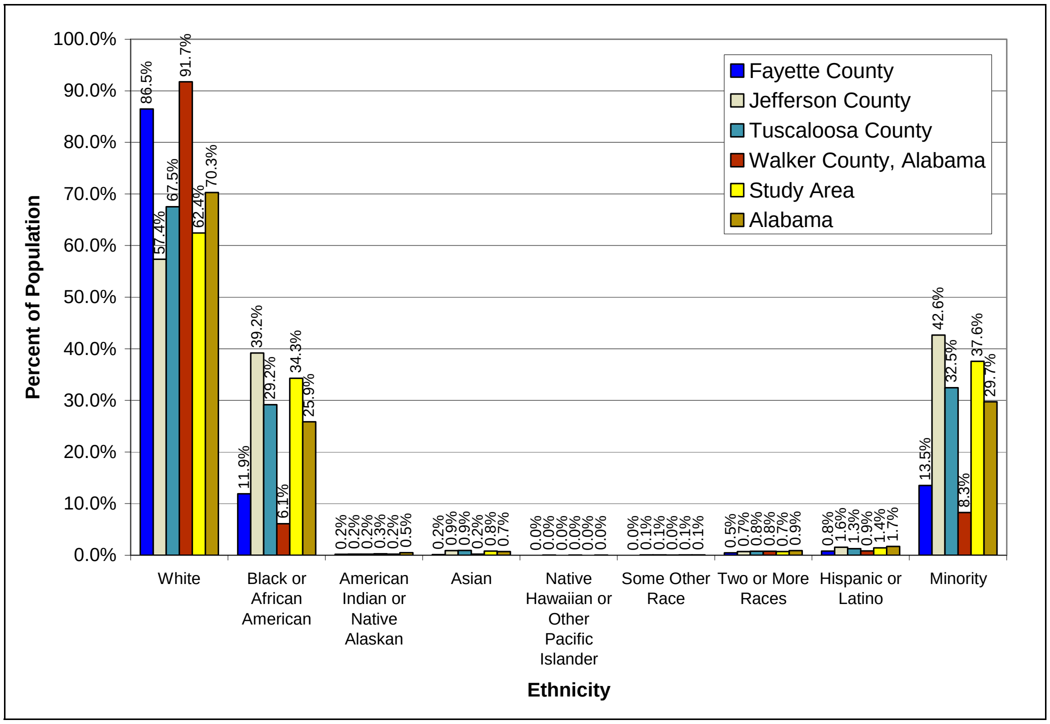
Source: BEA Regional Economic Accounts, Table CA1-3-Population, 2007.

Figure G-2. Poverty Rate for BLM Non-USFS FMO Study Area in Alabama



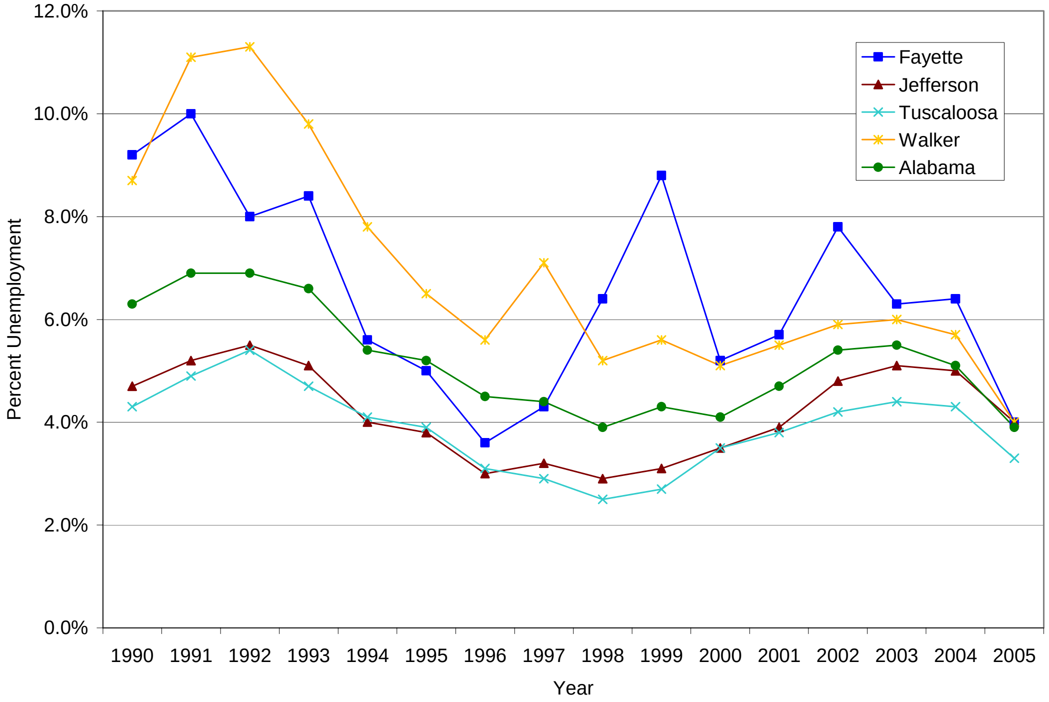
Source: Census 2000 SF 3, Quick Tables DP-3. Profile of Selected Economic Characteristics.

Figure G-3. Ethnicity for BLM Non-USFS FMO Study Area in Alabama



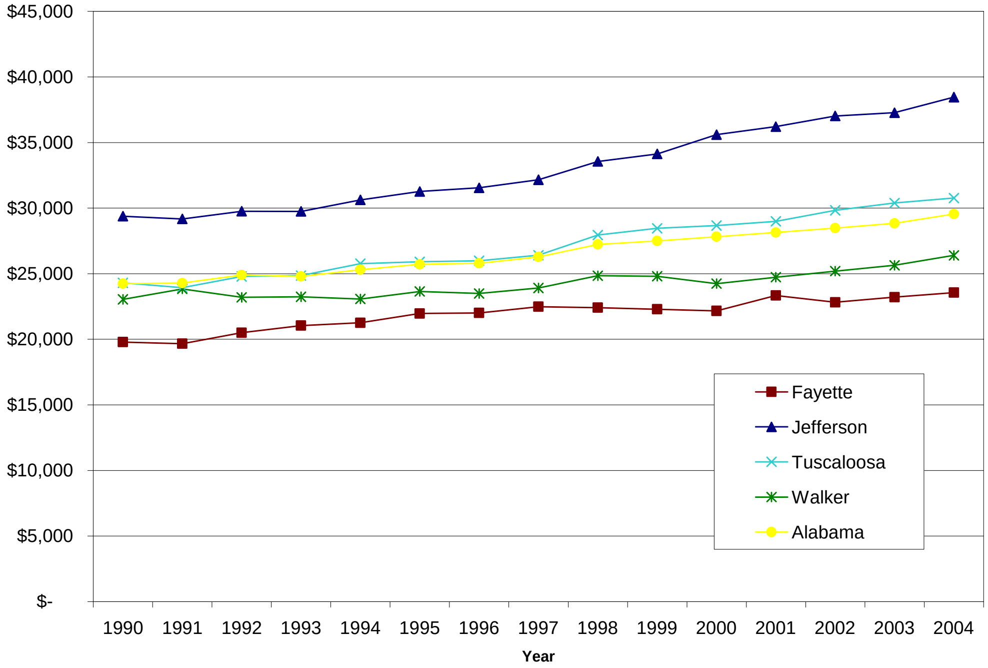
Source: Census 2000 SF 1, Quick Tables QT-P4. Profile of Selected Economic Characteristics.

Figure G-4. Unemployment Trends for BLM Non-USFS FMO Study Area in Alabama (1990–2005)



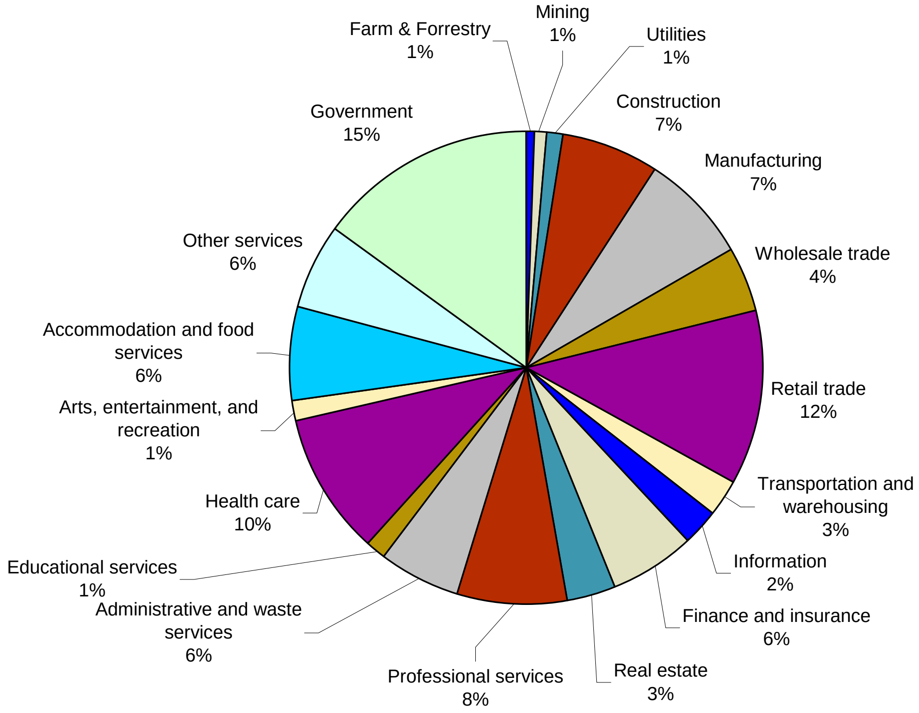
Source: Bureau of Labor Statistics, Local Area Unemployment Statistics – Not Seasonally Adjusted, 2007.

Figure G-5. Per Capita Income Trends for BLM Non-USFS FMO Study Area in Alabama (1990–2004)



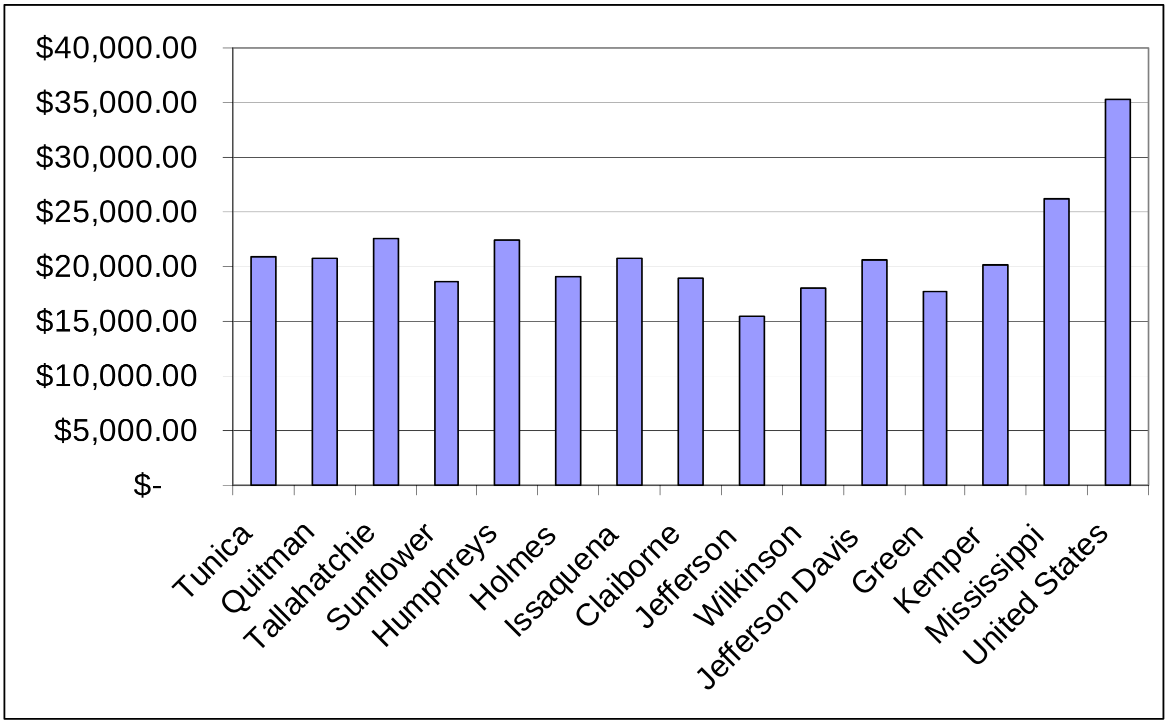
Source: Bureau of Economic Analysis, 2007, adjusted to 2006$ with the Bureau of Labor Statistics CPI.

Figure G-6. Employment by Industry for BLM Non-USFS FMO Study Area in Alabama (2004)



Source: Bureau of Economic Analysis, 2007.

Figure G-7. Personal Income Per Capita in Mississippi (2006$)



Source: Bureau of the Census, reported in 2004$, adjusted to 2006$ with the Bureau of Labor Statistics CPI.

Figure G-8. Employment by Industry for Mississippi, 2005

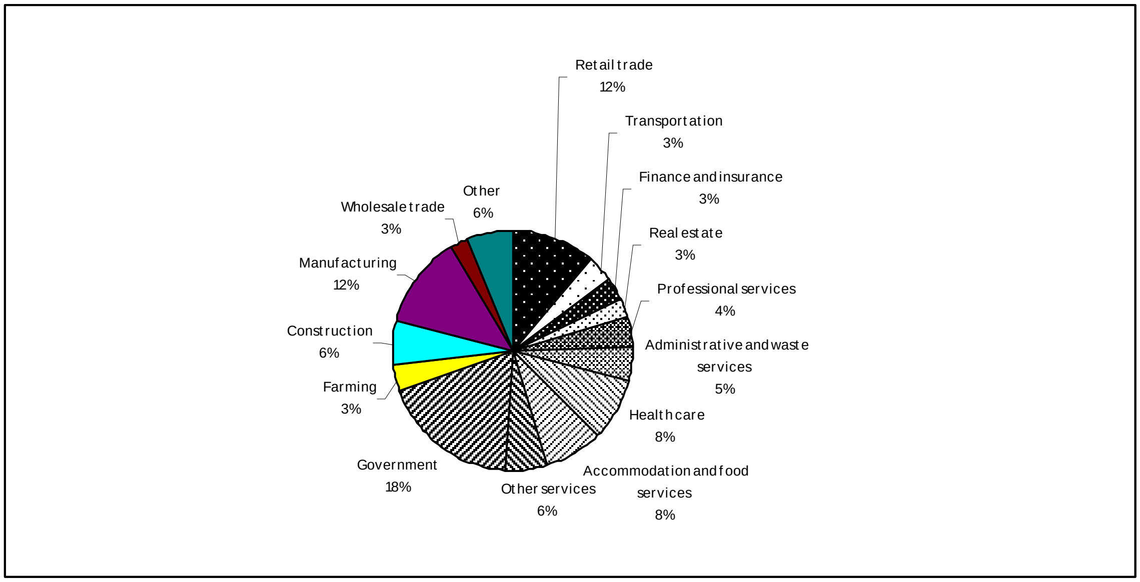
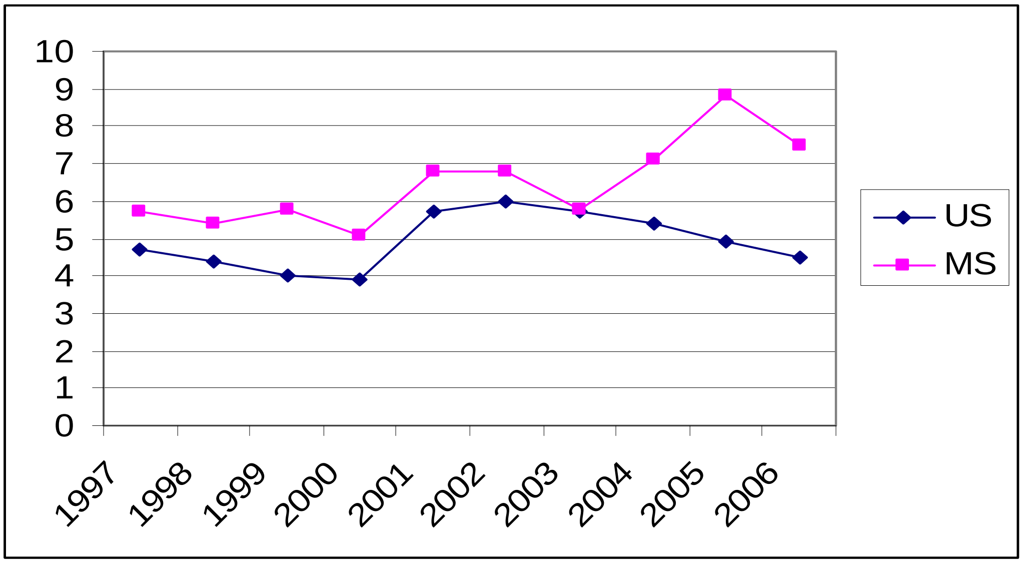
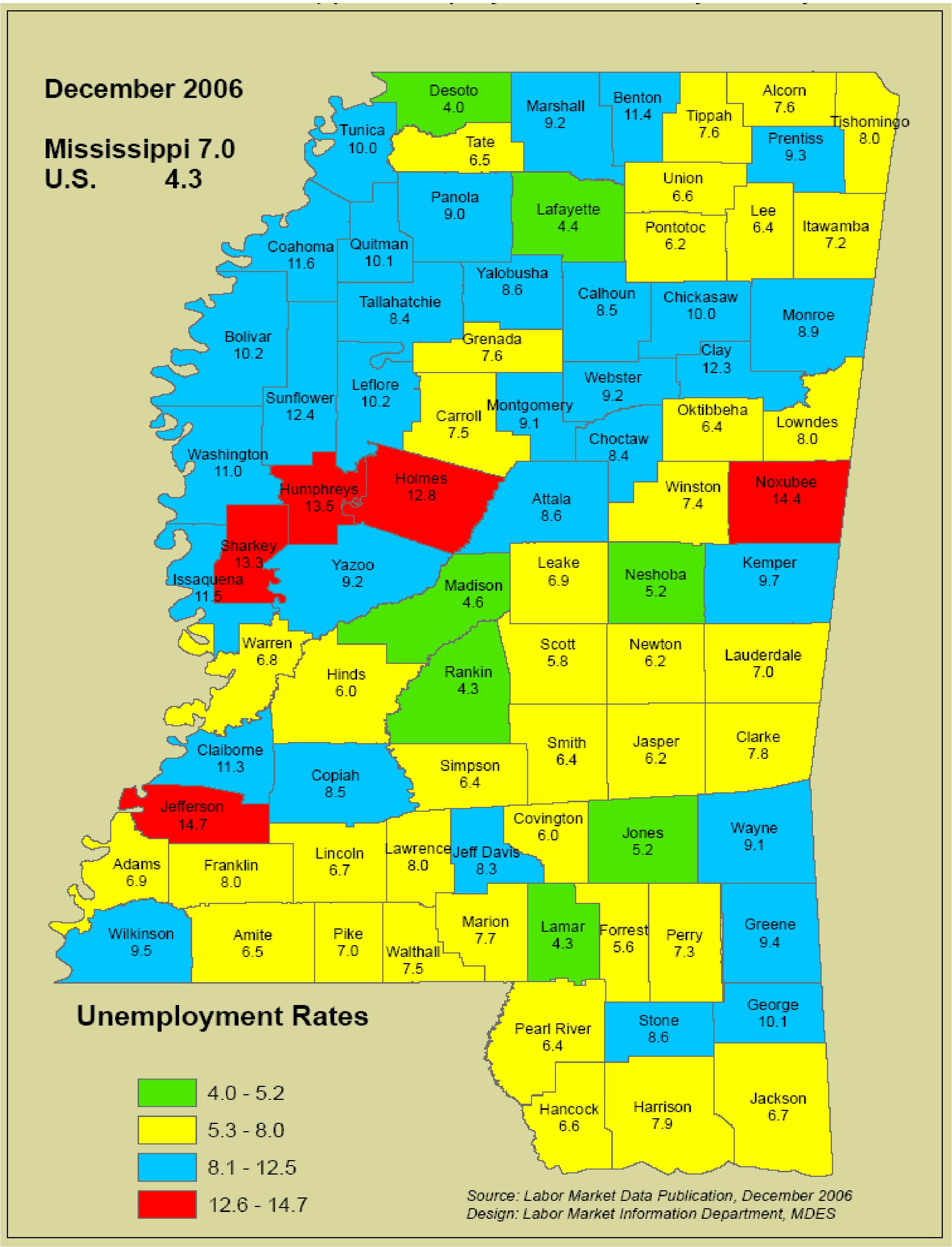


Figure G-9. Unemployment Rate for Mississippi and United States, 1997-2006



Source: Bureau of Labor Statistics

Figure G-10. Mississippi Unemployment Rates by County



Source: Labor Market Data Publication, December 2006
Design: Labor Market Information Department, MDES

Figure G-11. Mississippi Population

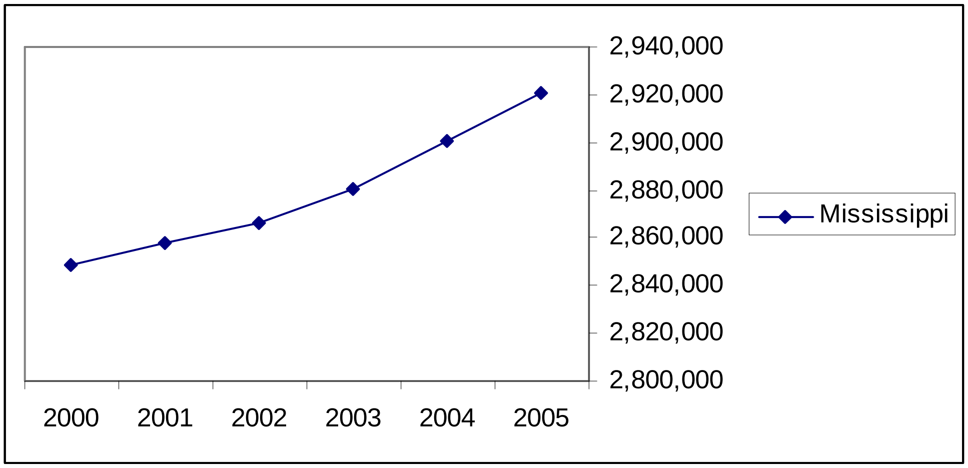
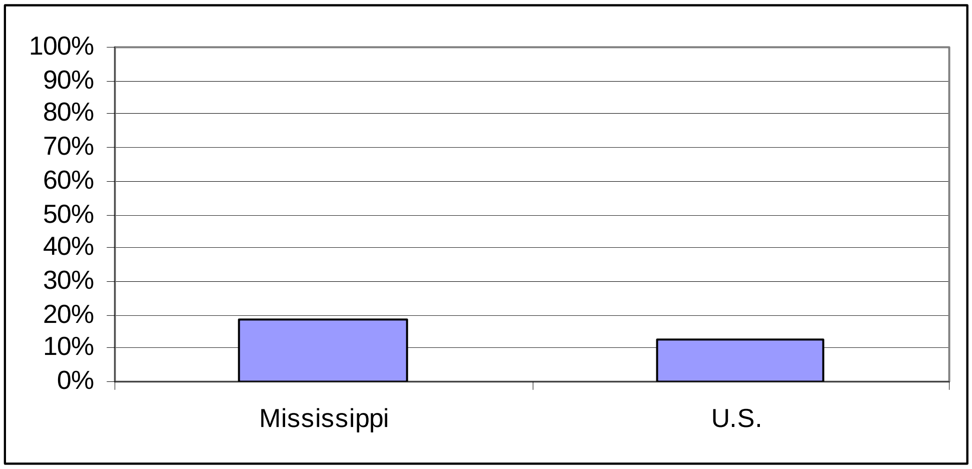


Figure G-12. Poverty Rate for Mississippi and United States, 2003



Source: Bureau of the Census

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APPENDIX H—WATER RESOURCES

The following table lists river miles and areas of water bodies in Alabama and Mississippi that cross non-U.S. Forest Service Federal mineral ownership (non-USFS FMO).

Table H-1. River Miles and Areas of Water Bodies Crossing Non-USFS Federal Mineral Ownership

Non-USFS FMO	River Miles (miles)	Area if Water Bodies (acres)
Mississippi	48.41	33,140
Alabama	26.54	2,190

BLM-administered surface tracts and FMO occur within river basins throughout Alabama and Mississippi. There are a total of 14 river basins in the State of Alabama: the Tennessee, Upper Tombigbee, Lower Tombigbee, Black Warrior, Coosa, Cahaba, Tallapoosa, Chattahoochee, Choctawhatchee, Chipola, Perdido-Escambia, Alabama, Mobile, and Escatawpa River Basins (ADEM 2004). In the State of Mississippi there are a total of 10 river basins: the Big Black River, Coastal Streams, Mississippi River, North Independent Streams, Pascagoula River, Pearl River, South Independent Streams, Tennessee River, Tombigbee River, and Yazoo River Basins (MDEQ 2005). A brief description of each of these major river basins follows.

STATE OF ALABAMA

Tennessee

The Tennessee River Basin is one of the largest river systems passing through Alabama. Parts of this river basin occupy seven states in the southeastern United States. The Alabama portion of the Tennessee River Basin is located along what is known as the “Great Bend,” which is an Indian term that early settlers used to describe the southern bend of the Tennessee River as it reached into Alabama. The Tennessee River Basin in Alabama drains roughly 13 percent of the state’s 51,705 square miles. The basin is home to the Alabama cavefish, a rare freshwater fish (Rivers of Alabama 2005).

The Tennessee River begins near Holston and French Broad Rivers near Knoxville, Tennessee. After flowing along a 652-mile course, the river empties into the Ohio River near Paducah, Kentucky. The Tennessee River cuts westward across northern Alabama as it flows through the Cumberland Plateau physiographic province to Muscle Shoals in northwestern Alabama. The river falls 137 feet in 37 miles at Muscle Shoals, which serves as the dividing line between the Upper and Lower Tennessee. In 1933 the Tennessee Valley Authority (TVA) constructed the Wilson Dam on the river near Muscle Shoals (Rivers of Alabama 2005). There are 10 locks and dams located along the Tennessee River (TVA 2005).

Upper Tombigbee/Lower Tombigbee

The Tombigbee River begins in Prentiss and Tishomingo Counties in northeastern Mississippi. The Upper Tombigbee flows through Mississippi to Alabama and crosses the state line at Aliceville Lake in Pickens County. The river then continues in a southeasterly direction to Demopolis, Alabama, and merges with the Black Warrior River, one of its largest tributaries. The Upper Tombigbee River Basin occupies approximately 9,000 square miles and includes sections of the Fall Line Hills, Pontotoc Ridge, and Black Prairie districts of the East Gulf Coastal Plain physiographic province (Rivers of Alabama 2005).

The Lower Tombigbee River Basin is the portion of the basin below the confluence with the Black Warrior River. This section of the basin flows 175 miles and drains 4,659 square miles in seven Alabama counties before merging with the Alabama River to form the Mobile River (Rivers of Alabama 2005).

Black Warrior

The Black Warrior River Basin drains approximately 6,276 square miles of land in Alabama. The principal forks of the Black Warrior River are the Sipsey, Mulberry, and Locust, which begin in northern Alabama and converge to form the Black Warrior. The Black Warrior River falls across large shoals before reaching Tuscaloosa, Alabama. The Black Warrior River mainstem occupies five counties in Alabama: Jefferson, Walker, Tuscaloosa, Hale, and Greene (Rivers of Alabama 2005).

The river flows across the fall line, a geologic barrier separating the high and hilly Cumberland Plateau from the flat and loping East Gulf Coastal Plain. The Upper Black Warrior River is above the fall line and flows through sandstones, shales, and limestones of the Cumberland Plateau and streambeds. The elevations range from 1,100 feet on the northern slopes to 600 feet near Tuscaloosa and the Fall Line Hills. The Lower Black Warrior River flows below the fall line through the upper Coastal Plain, with elevations between 150 and 300 feet. Approximately 75 percent of the Black Warrior River Basin is above the fall line, and approximately 25 percent flows below the fall line. The river ends at the east bank of the Tombigbee River just north of Demopolis (Rivers of Alabama 2005).

The Sipsey Fork, a National Wild and Scenic River, is a tributary of the Black Warrior River. Approximately 61 miles of the river within the William B. Bankhead National Forest are permanently protected (Rivers of Alabama 2005).

Coosa

The Coosa River Basin begins in northwestern Georgia before flowing to and entering the State of Alabama. The main tributaries of the Coosa River include the Conasauga, Coosawattee, Oostanaula, and Etowah Rivers. The Coosa River’s mainstem flows for approximately 286 miles before arriving north of Montgomery. Approximately 255 miles of the Coosa River’s mainstem rests in Alabama, which is 89 percent of the total river miles. The Coosa River watershed covers about 10,200 square miles, of which about 4,500 square miles (46 percent) are in Georgia and 5,400 square miles (53 percent) are in Alabama (Rivers of Alabama 2005).

The Coosa River Basin occupies five different physiographic regions. The majority of the Coosa River Basin is split between the Valley and Ridge and Piedmont provinces. Approximately 34 percent of the river basin occurs in the Valley and Ridge physiographic province, with altitudes ranging from 600 to 1,600 feet; 34 percent is in the Piedmont province; 4 percent is in the Blue Ridge province; 8 percent is in the Cumberland Plateau in Alabama, with altitudes of 1,500 to 1,800 feet; and 2 percent is in the Coastal Plain province (Rivers of Alabama 2005).

Cahaba

The Cahaba River is one of the longest free-flowing rivers in the State of Alabama. The Cahaba flows for about 190 miles and occupies approximately 1,163,574 acres. The Cahaba River Basin flows through portions of eight counties: Jefferson, St. Clair, Shelby, Bibb, Perry, Dallas, Tuscaloosa, and Chilton (Rivers of Alabama 2005).

The Cahaba River begins at the Cahaba Mountain northeast of Birmingham, at an elevation of approximately 1,200 feet. The Cahaba River has an average slope of 15 feet per mile for the first 25 to 30 miles, then drops to a slope of 2.5 feet per mile for about 44 miles, and finally flattens to a slope of 0.6 feet per mile. Elevation in the Cahaba River Basin ranges from 1,100 feet in Shelby County to 100 feet at the confluence with the Alabama River (Rivers of Alabama 2005).

The Cahaba River Basin is located in two physiographic regions of the State of Alabama. The Upper Cahaba River Basin lies in the Valley and Ridge province, and the Lower Cahaba River Basin lies in the East Gulf Coastal Plain province. The majority of the basin (84 percent) lies within the Valley and Ridge province. The remainder of the basin (14 percent) lies in the East Gulf Coastal Plain Province (Rivers of Alabama 2005).

Tallapoosa

The Tallapoosa River originates in Paulding County, Georgia, which is located 40 miles west of Atlanta. Originating at an elevation of about 1,145 feet, the river flows southwest for about 195 miles into Alabama and then flows west after meeting Uphapee Creek for 40 miles to join the Coosa River near Wetumpka. The 235-mile river drains a basin area of 4,680 square miles. Approximately 3,960 square miles lie in the State of Alabama, accounting for 85 percent of the land area (Rivers of Alabama 2005).

The Tallapoosa River falls at a rate of 12 feet per mile for its first 15 miles. The river then descends to 3.4 feet per mile. From Thurlow Dam to its mouth, the Tallapoosa River falls at a rate of 1.6 feet per mile. The Tallapoosa River’s width varies from 250 feet to 700 feet along its course, and the river has banks that are 20 feet high along the floodplain (Rivers of Alabama 2005).

Approximately 71 percent of the Tallapoosa River Basin lies in the Piedmont physiographic province. Another 29 percent of the river basin lies in the Coastal Plain province, with elevations between 50 and 850 feet (Rivers of Alabama 2005).

Chattachoochee

The Chattahoochee River begins in the Blue Ridge Mountains of Georgia. The Chattahoochee River mainly flows southwest through Georgia until it reaches Alabama. From the towns of Lannett, Alabama and West Point, Georgia, the Chattahoochee River is shared between the two states on a river course toward the Gulf of Mexico. The river flows along Alabama’s boundary for 160 miles until it reaches the southeastern corner of the state before flowing into Florida (Rivers of Alabama 2005).

The Chattahoochee River Basin has a total drainage area of 8,770 square miles. The Alabama portion of the Chattahoochee River in Alabama covers an area of 2,830 square miles, or 32 percent of the total Chattahoochee River Basin. This section of the Chattahoochee River Basin is about 35 miles across at its widest point. Principal tributaries of the river are the Uchee, Cowikee, and Abbie Creeks. There are 13 hydroelectric dams in the Chattahoochee Basin; however, all of the tributaries to the Chattahoochee are free-flowing. Major aquifers in the Alabama portion of the Chattahoochee River Basin are the Libson, Nantafalia-Clayton, Providence-Ripley, and Tuscaloosa (Rivers of Alabama 2005).

Principal cities in Alabama located along the Chattahoochee River are Lanett, Phenix City, Eufala, and Dothan. The watershed of the Chattahoochee River flows through counties in Alabama: Chambers, Lee, Russell, Barbour, Henry, Houston, Randolph, Macon, and Bullock (Rivers of Alabama 2005).

The Chattahoochee River Basin occupies three physiographic regions. In the upper Chattahoochee River Basin, the headwaters occupy the Blue Ridge Province and then flow into the Piedmont Province. At the Alabama/Georgia border the Piedmont Province transitions into the Southern Coastal Plain Province (Rivers of Alabama 2005).

Choctawhatchee

The Choctawhatchee River begins in Dale County near Newton, Alabama. The river flows for approximately 138 miles and empties into Choctawhatchee Bay in Florida. The Choctawhatchee River Basin encompasses approximately 4,748 square miles. The majority of the basin, about 66 percent, or 3,400 square miles, occurs in Alabama. About 50 miles of the mainstem of the river is located in Alabama. The Alabama portion of the Choctawhatchee River Basin comprises 2 million acres and lies in portions of 10 Alabama counties: Bullock, Barbour, Coffee, Geneva, Covington, Houston, Crenshaw, Dale, Henry, and Pike. The entire Choctawhatchee River Basin lies within the physiographic region of the East Gulf Coastal Plain Province, which drains about 25 percent of the state (Rivers of Alabama 2005).

Chipola

The Chipola River flows through the States of Alabama and Florida. Its total length is 125 miles through the two states. The Chipola River Basin is part of the Chattahoochee watershed (allrefer.com 2005).

Perdido-Escambia

The Perdido-Escambia River Basin flows through Baldwin and Escambia counties in Alabama and Escambia County, Florida. The Perdido River forms the boundary between the States of Alabama and Florida. This river basin encompasses a total area of 1,250 square miles. Before flowing into the Gulf of Mexico, the Perdido River forms Perdido Bay. The Perdido River flows approximately 44 miles before reaching Perdido Bay just north of Lillian, Alabama. Major cities within the Perdido-Escambia River Basin are Perdido, Bay Minette, Robertsdale, and Summerdale. The Escambia River also flows through Alabama and Florida. The Escambia River flows into Escambia Bay, an arm of Pensacola Bay. Large tributaries of the Escambia River include Patsaliga Creek, Big Escambia Creek, and the Sepulga River (Rivers of Alabama 2005).

Alabama

The Alabama River is formed by the confluence of the Coosa and Tallapoosa Rivers, 15 miles north of the city of Montgomery. The Alabama River begins at the fall line, and the Alabama River Basin lies almost entirely within the flat topography of the Coastal Plain Province. At the City of Montgomery, the Alabama River slopes at 0.82 foot per mile; below the fall line the slope is approximately 0.34 foot per mile. The Alabama River's total length is 315 miles; it drains approximately 22,168 square miles. The Alabama River Basin comprises an area of 6,023 square miles (Rivers of Alabama 2005).

Much of the Alabama River has been altered by three U.S. Army Corps of Engineers dam projects that were constructed in the 1960s and 1970s. Approximately 233 miles of the river are impounded by the Robert F. Henry, Millers Ferry, and Claiborne lock and dams (Rivers of Alabama 2005).

Large tributaries of the Alabama River include Turkey, Little River, Pintlala, Limestone, Pursley, Pine Barren, Mulberry, Boguechitto, Cedar, Big Swamp, and Catoma Creeks. The river has a carrying capacity of 100,000 to 150,000 cfs. The Alabama River flows through nine Alabama counties: Elmore, Autauga, Montgomery, Lowndes, Dallas, Wilcox, Monroe, Baldwin, and Clarke (Rivers of Alabama 2005).

Mobile

The area where the Mobile River meets Mobile Bay can be described as a delta. The land area between the Mobile River on the west edge of the delta and the Tensaw River on the east edge is marshland. About one-third of the area also is a vast network of waterways and river basins. More than 250 separate waterways, such as rivers, bays, creeks, bayous, lakes, cutoffs, branches, and sloughs, have been identified and charted (Rivers of Alabama 2005).

Mobile Bay is the receiving basin for the sixth largest river system in the United States. The river drains the fourth largest watershed in the United States in terms of flow volume. Approximately 65 percent of Alabama's land area drains its waters into Mobile Bay. Mobile Bay is approximately 32 miles long and 23 miles wide. The average depth of the Bay is about 10 feet (Rivers of Alabama 2005).

Escatawpa

The Escatawpa River Basin is approximately 15 miles wide and 100 miles long. The length of the Escatawpa River is 80 miles. The Escatawpa River begins in southwest Alabama, less than 1 mile from the Alabama/Mississippi border in Washington County, Alabama. The Escatawpa River flows south from Alabama into Mississippi. The main tributaries of the Escatawpa River flow through Washington and Mobile counties in Alabama (Rivers of Alabama 2005).

STATE OF MISSISSIPPI

Big Black River Basin

The Big Black River Basin is approximately 155 miles in length and 22 miles in width and is located in west-central Mississippi. The river basin covers an area of approximately 3,400 square miles. The Big Black River Basin has approximately 6,638 total miles of perennial and intermittent rivers and streams. The Big Black River flows entirely within Mississippi; it begins in Webster County and flows southwest for approximately 300 miles to its mouth at the Mississippi River near Vicksburg (MDEQ 2004).

Tributaries to the Big Black River include Big Bywy Ditch, Zilpha Creek, Apookta Creek, Doaks Creek, Bear Creek, Bogue Chitto Creek, and Fourteen Mile-Bakers Creek. The Big Black River Basin occupies 13 counties and 24 municipalities. According to the 2000 census, about 220,000 people live in the Big Black River Basin. Larger cities in the basin include Jackson, Clinton, and Canton (MDEQ 2004).

Coastal Streams Basin

The Coastal Streams Basin is located in southern Mississippi. The Basin begins in Lamar County and extends south, with Pearl River as its western boundary and the eastern boundary, mainly consisting of the Alabama state line. The Coastal Streams Basin drains an area of about 1,545 square miles and empties into the Gulf of Mexico. A total of 2,442 miles of perennial and intermittent rivers and streams occur in the Basin (MDEQ 2004).

The Coastal Streams Basin includes the Mississippi Sound and the following barrier islands: Cat, Ship, Deer, Horn, Round, and Petit Bois Islands. The topography of the Costal Streams Basin ranges from pine forests and low rolling hills in the upper part to low-lying flatlands and salt marsh along the coast (MDEQ 2004).

Major cities located in the basin include Biloxi, Gulfport, Bay St. Louis, Pass Christian, Ocean Springs, and Pascagoula. The Coastal Streams Basin's population is estimated at 426,231. The Coastal Streams Basin is mainly rural, with an average population density of 137 people per square mile (MDEQ 2004).

Mississippi River Basin

The Mississippi River Basin is a large river system, comprised of 2,350 river miles, that drains 31 states before reaching the Gulf of Mexico. The Mississippi River Basin consists of 1.2 million square miles. Approximately 12 million people live in the river basin in approximately 125 counties along the river (EPA 2003).

The Mississippi Alluvial Plain (MAP) encompasses the land on the banks of the Mississippi River in six states and is the original floodplain of the Mississippi River. The part of the MAP system that lies within the State of Mississippi extends the entire length of the state. Just south of Memphis, Tennessee, the plain fans out to encompass all of the land between the Mississippi and Yazoo Rivers. The flat lowland area in northwest Mississippi located in the MAP Region, known as the Delta, is widely recognized as a fertile and productive farmland. This region of the Mississippi River Basin is mostly a flat, broad, floodplain. Land in the Delta comprises alluvial deposits of sand and clay (MDEQ 2004).

North Independent Streams Basin

The North Independent Streams Basin is located in north Mississippi. The basin consists of streams that mainly drain into Tennessee. The North Independent Streams Basin occupies seven counties in northern Mississippi. Major streams in the North Independent Streams Basin include the Tuscumbia River, Horn Lake Creek, Muddy Creek, the Wolf River, and the Hatchie River. The basin comprises a total of 1,956 miles of perennial and intermittent rivers and streams (MDEQ 2004).

The North Independent Streams Basin is composed of portions of four physiogeographic subregions: the Loess Bluffs, Red Clay Hills, Flatwoods, and Pontotoc Ridge. Most of these regions are made up of low to high rolling hills, mainly forested (MDEQ 2004).

The two major cities located in the North Independent Streams Basin are Southhaven, Tennessee, and Corinth, Alabama. The population of the counties within the basin was estimated in 2000 at approximately 182,000 (MDEQ 2004).

Pascagoula River Basin

The Pascagoula River Basin is the second largest basin in the State of Mississippi. It is approximately 164 miles long and 84 miles wide. The basin has a total of approximately 14,777 miles of perennial and intermittent rivers and streams. The Leaf and Chickasawhay Rivers are the two main headwater streams in the Pascagoula River Basin. The Pascagoula River Basin occupies 22 counties and drains an area of approximately 9,600 square miles before draining into the Gulf of Mexico. The Pascagoula River system is the last unimpeded large river system in the lower 48 states. The Black Creek, which is located in the Pascagoula River Basin, is the only National Wild and Scenic River in the State of Mississippi (MDEQ 2004).

Near the Gulf Coast, the topography of the Pascagoula River Basin is low-lying flatlands, forested wetlands, and marshlands. Inland, the Pascagoula River Basin consists of gently rolling hills and broad, flat floodplains. The major urban areas in the basin are Meridian, Laurel, Hattiesburg, and Pascagoula.

The Pascagoula River Basin has an estimated population of 716,925. The Pascagoula River Basin is mainly rural, with an average population density of about 75 people per square mile (MDEQ 2004).

Pearl River Basin

The Pearl River Basin is located in east-central and southwest Mississippi and southeastern Louisiana. The river basin starts in Philadelphia, Mississippi, and flows through central Mississippi to the coast. The Pearl River is approximately 490 miles long and drains an area of 8,760 square miles. The Pearl River Basin occupies 24 counties in east-central and southern Mississippi. The river basin has a total of approximately 16,300 miles of perennial and intermittent rivers and streams (MDEQ 2004).

Major tributaries to the Pearl River include the Yockanookany River, Bogue Chitto River, and Strong River. The Pearl River originates in Neshoba County by the confluence of Bogue Chitto, Nanawaya, and Tallahaga Creeks. The Pearl River flows southwest for approximately 146 miles to the Ross Barnett Reservoir in Jackson, and then flows 217 miles in a southerly direction to the West Pearl and Pearl Rivers. These channels continue for 44 and 48 miles, respectively, and empty into Lake Borgne in Louisiana and the Mississippi Sound. The West Pearl River flows entirely within the State of Louisiana. The lower 61 miles of Pearl River form part of the boundary between the States of Mississippi and Louisiana (MDEQ 2004).

Much of the upper part of the Pearl River Basin consists of gently rolling to hilly terrain. In the southern part of the basin the land is flatter as low, rolling, forested hills give way to lowlands and marshes near the coast. The only large urban area in the Pearl River Basin is Jackson, Mississippi (MDEQ 2004).

South Independent Streams Basin

The South Independent Streams Basin is located in southwest Mississippi. The Basin consists of streams that drain into the Mississippi River below the Big Black River and streams that drain into Louisiana, west of the Pearl River Basin. The Basin occupies 4,418 square miles and comprises 11 counties in Mississippi. There are 7,499 miles of perennial and intermittent rivers and streams in the Basin. Major streams in the South Independent Streams Basin include the Homochitto River, Bayou Pierre, the Tangipahoa River, and the Amite River (MDEQ 2004).

Most of the South Independent Streams Basin region is made up of low, rolling hills and is largely forested. On the western side of the Basin, high bluffs dominate the topography as the land meets the Mississippi River. The two largest cities in the basin are Natchez and Vicksburg, which are located on the Mississippi River. The population within the South Independent Streams Basin was estimated in 2000 at 439,933 (MDEQ 2004).

Tennessee River Basin

The Tennessee River Basin covers an area of 417 square miles in the northeast Mississippi. The Tennessee River Basin is composed of Pickwick Lake, a portion of the Tennessee River, a portion of Bear Creek, and the Yellow Creek segment of the Tennessee-Tombigbee Waterway. Other smaller water bodies in the Tennessee River Basin include Indian Creek, Cripple Deer Creek, and Little Cripple Deer Creek. The Tennessee River Basin has a total of 646 miles of perennial and intermittent rivers and streams in Mississippi (MDEQ 2004).

The Mississippi portion of the Tennessee River Basin lies within the Fall Line Hills of the East Gulf Coastal Plain. The topography of the river basin is gently rolling hills, sharp ridges, and broad alluvial floodplains over rocks of sedimentary origin. Portions of the river basin landscape are in Tishomingo State Park and are characterized by rock formations and fern-filled crevices (MDEQ 2004).

The only major urban area of the basin is the city of Iuka. The Tennessee River Basin occupies four counties in Mississippi: Alcorn, Itawamba, Prentiss, and Tishomingo. The Tennessee River Basin is sparsely populated, with fewer than 30,000 persons inhabiting the area. According to the 2000 census, approximately 27,630 people live in the river basin within Mississippi's boundaries (MDEQ 2004).

Tombigbee River Basin

The Tombigbee River Basin is located in northeastern Mississippi. The Tombigbee River Basin covers approximately 6,100 square miles in Mississippi and 7,600 square miles in Alabama. The Mississippi portion of the Tombigbee River Basin consists of 56 watersheds and is approximately 190 miles in length and 48 miles in width. The Tombigbee River begins in Itawamba County, Mississippi, from the convergence of Big Brown Creek and Mackeys Creek. A significant hydrologic feature of the Tombigbee River Basin is the Tennessee-Tombigbee Waterway. The waterway uses a series of dams and manmade canals to connect the Tennessee River in Tennessee to Mobile Bay in Alabama. The Tombigbee River Basin in Mississippi has approximately 11,690 miles of perennial and intermittent rivers and streams. Major tributaries to the Tombigbee River and the waterway include Town Creek, Chuquatonchee Creek, Chiwapa Creek, Luxapallila Creek, and the Buttahatchee, Sucarnoochee, and Noxubee Rivers (MDEQ 2004).

The topography of the Tombigbee River Basin ranges from hilly to gently rolling, with elevations in the headwaters from 500 to 600 feet above sea level, to flat and gently rolling topography in the central and south portion, with elevations from 100 to 300 feet. The Tombigbee River Basin is mostly forested. The major urban populations in the river basin are in Tupelo, Columbus, and Aberdeen. The Tombigbee River Basin occupies 19 counties in Mississippi. According to the 2000 census, approximately 382,109 people live in the river basin (MDEQ 2004).

Yazoo River Basin

The Yazoo River Basin is located in the northwest and west-central part of Mississippi. The basin covers 13,355 square miles in 30 counties. The basin is approximately 200 miles long and approximately 100 miles wide. The Yazoo River Basin eventually drains the Yazoo River into the Mississippi River near Vicksburg, Mississippi. The Yazoo River Basin has 24,554 miles of rivers and streams. The Yazoo River begins in Leflore County from the convergence of its main headwater tributaries, the Tallahatchie River and the Yalobusha River. Major rivers in the Yazoo River Basin include the Coldwater, Little Tallahatchie, Tallahatchie, Yocona, Yalobusha, Big Sunflower, and Yazoo Rivers (MDEQ 2004).

The Delta portion of the Yazoo River Basin is a geographic feature and is part of the alluvial plain of the Mississippi River. The only outlet to the Mississippi River for the basin is the Yazoo River mainstem at Vicksburg in central Mississippi. The Yazoo River Basin includes a hilly upland in north and north-central Mississippi and an extensive, flat lowland area in the north and west. Major cities in the Yazoo River Basin include Grenada, Batesville, Oxford, Holly Springs, and New Albany. The Yazoo River Basin has an estimated population of 625,524 and encompasses approximately one-fifth of Mississippi's population. The river basin is mainly rural, with an average population density of approximately 45 persons per square mile (MDEQ 2004).

APPENDIX I—WITHDRAWN LANDS

Withdrawn lands are public lands administered by other Federal or State agencies. Withdrawals are generally for a specific purpose such as a reclamation project or wildlife refuge. When the agency to which the withdrawal is granted ceases to use the land for the specified purpose, the withdrawal will be re-evaluated, and if appropriate, the management of that area will revert to the Bureau of Land Management (BLM). These lands are withdrawn from settlement, location, sale or entry and reserved for use by the designated agency. The following tables list tracts in Alabama and Mississippi that have been withdrawn to management by other Federal agencies.

Table I-1. Withdrawn Lands in Alabama

Agency/Use	Legal Description	Serial/PLO No.	Acres
Federal Energy Regulatory Commission (FERC) Hydro Power	St. Stephens Meridian T. 22 N., R. 6 E., Sec. 1 (see case file)	ALES 032320	1.00
FERC Hydro Power	St. Stephens Meridian T. 21 N., R. 16 E., Sec. 14, Fractional (FRL), W. of Coosa River, Lots 1-12	ALES 035022	66.16
FERC Hydro Power	St. Stephens Meridian T. 21 N., R. 17 E., Sec. 30, W2NW, FRL, W. of Coosa River Sec. 32, C East of Coosa River	ALES 035023	111.85
FERC Hydro Power	T. 8 S., R. 9 E., Sec. 1, Lots 1-4; Sec. 2, Lots 1-3; Sec. 10, Lots 1-2; Sec. 11, Lots 1-6; Sec. 12, Lot 1; Sec. 14, Lots 1-3; Sec. 15, Lots 1-4; Sec. 22, Lots 1-4; Sec. 23, Lots 1-4; Sec. 26, Lots 1-2; Sec. 27, Lots 1-5, E2NE; Sec. 28, Lot 1; Sec 33, Lots 1-3, Sec. 34, Lot 1	ALES 035024	1,545.41
FERC Hydro Power	T. 6 S., R. 10 E., Sec. 34, N2SW, SWSW	ALES 035025	112.50
Tennessee Valley Authority (TVA)	Huntsville Meridian T. 4 S., R. 7 E., Sec. 28, NWNW	ALES 036757	40.00
TVA – Tennessee River	Lands bordering the Tennessee River, and also all islands and towheads in the river in legal subdivisions described in Executive Orders 2246 and 8059	ALES 36760	1,500.00
TVA	T. 6. S., R. 1 E., Sec. 26, SE (FRL, north of Tennessee River); T. 6 S., R. 2 E., Sec. 31, NWSW	ALES 36762	92.00

Agency/Use	Legal Description	Serial/PLO No.	Acres
U.S. Forest Service (USFS) Bankhead National Forest (N.F.) Sipsey River	Huntsville Meridian T. 9 S., R. 8 W., Sec. 8, S2NE	ALES 36763	80.00
USFS Bankhead N.F. Kinlock Camp Recreation Area	T. 8 S., R. 9 W., Sec. 32, E2SESWNW	“	5.00
USFS Bankhead N.F. And FERC Power Project 2165	T. 9 S., R. 8 W., Sec. 33 NENE; Sec 35, S2SW; T. 10 S., R. 6 W., Sec. 19, NESW; Sec. 30, N2SE; Sec. 31, N2SW; T. 10 S., R. 7 W., Sec. 23, SWNW; Sec 24, W2NE, NESW; Sec 25, SESE; T. 11 S., R. 5 W., Sec. 17, SENE; T. 11 S., R. 6 W., Sec. 5, SWSE; Sec 7, NWNW; Sec. 11, NWNE; Sec. 21, SENE; Sec. 22, NENW, E2SW; Sec. 23 SESE; Sec. 25, N2NW; Sec. 27, SWNE, NENW; Sec. 32 SWNW; T. 11 S., R. 7 W., Sec. 12, W2SW; Sec. 14, SESE; Sec. 22, NESW; Sec. 23, NWSE T. 12 S., R. 6 W., Sec. 2 NESE; Sec. 10, SESW; Sec. 13, SENE; T. 12 S., R. 7 W., Sec. 18, NESE; T. 12 S., R. 8 W., Sec. 13 SENE, SENW; Sec. 14 SWNW	“	1,560.00
USFS Bankhead N.F.	Huntsville Meridian T. 7 S., R. 6 W., Sec. 31, FRL	“	39.34
USFS Bankhead N.F.	T. 7 S., R. 7 W., Sec. 30, FRL	“	36.55

Agency/Use	Legal Description	Serial/PLO No.	Acres
USFS Bankhead N.F.	T. 7 S., R. 8 W.,	“	
	Sec. 23, FRL		39.00
	Sec. 24, FRL		156.66
	Sec. 25, FRL		164.43
	Sec. 26, FRL, 77.05; FRL, 39.51:		116.56
	Sec. 27, FRL		40.10
	Sec. 31, FRL		443.87
	Sec. 32, FRL, 154.78; FRL, 158.52:		313.30
	Sec. 33, FRL		77.83
	Sec. 34, FRL		39.31
	Sec. 36, FRL		39.37
USFS Bankhead N.F.	T. 7. S., R. 9 W.,	“	
	Sec. 19, FRL		37.86
	Sec. 29, FRL		38.17
	Sec. 33, FRL, 82.16; FRL, 78.43; FRL, 41.25:		201.84
	Sec. 34, FRL		41.99
	Sec. 35, FRL		42.71
	Sec. 36, FRL		315.78
USFS Bankhead N.F.	T. 7 S., R. 10 W.,	“	
	Sec. 8, FRL		40.98
	Sec. 13, FRL		41.72
	Sec. 24, FRL		37.07
	Sec. 27, FRL		40.01
USFS Bankhead N.F.	T. 8 S., R. 6 W.,	“	
	Sec. 2, FRL		41.31
	Sec. 4, FRL		84.41
	Sec. 14, FRL		41.56
	Sec. 15, FRL, 10.23; FRL, 82.93:		93.16
	Sec. 17, FRL, 37.91; FRL 40.51; FRL, 40.17:		118.59
	Sec. 18, FRL		39.64
	Sec. 20, FRL		40.12
	Sec. 22, FRL		38.33
	Sec. 29, FRL		40.17
	Sec. 30, FRL, 41.96: FRL, 40.67:		82.63
	Sec. 32, FRL		40.04
	Sec. 34, FRL		42.21

Agency/Use	Legal Description	Serial/PLO No.	Acres
USFS Bankhead N.F.	T. 8 S., R. 7 W.,	“	
	Sec. 3, FRL, 124.87; FRL, 40.61; FRL, 40.90:		206.83
	Sec. 5, FRL, 40.25; FRL, 77.84:		118.09
	Sec. 6, FRL, 80.23; FRL, 38.45:		118.68
	Sec. 7, FRL, 41.56; FRL, 39.26:		80.82
	Sec. 8, FRL		40.16
	Sec. 9, FRL		40.04
	Sec. 14, FRL		43.88
	Sec. 17, FRL		163.79
	Sec. 18, FRL		36.00
	Sec. 19, FRL		284.67
	Sec. 21, FRL		42.61
	Sec. 24, FRL, 39.47; FRL, 37.75:		77.22
	Sec. 31, FRL		154.56
	Sec. 32, FRL, 40.74; FRL, 83.09:		123.83
	Sec. 35, FRL		41.03
USFS Bankhead N.F.	T. 8 S., R. 8 W.,	“	
	Sec. 1, FRL		120.40
	Sec. 2, FRL		163.27
	Sec. 5, FRL, 76.85; FRL, 122.91:		199.86
	Sec. 6, FRL, 241.80; FRL, 80.88:		322.68
	Sec. 7, FRL, 38.53; FRL, 37.93; FRL, 82.24:		158.70
	Sec. 8, FRL		158.10
	Sec. 9, FRL		42.33
	Sec. 10, FRL		39.42
	Sec. 12, FRL		37.83
	Sec. 14, FRL		243.52
	Sec. 18, FRL, 39.64; FRL, 197.99:		237.63
	Sec. 19, FRL		197.41
	Sec. 20, FRL, 40.25; FRL, 231.16:		271.41
	Sec. 22, FRL		41.09
	Sec. 23, FRL		37.87
	Sec. 24, FRL, 84.74; FRL, 40.18:		124.92
	Sec, 26, FRL, 37.08; FRL, 40.62; FRL, 42.98:		120.68
	Sec. 28, FRL,		41.36
	Sec. 29, FRL, 41.03; FRL, 156.98		198.01
	Sec. 30, FRL, 39.86; FRL, 200.70:		240.56
	Sec. 32, FRL		402.50
	Sec. 33, FRL		236.76
	Sec. 34, FRL		272.02
USFS Bankhead N.F.	T. 8 S., R. 9 W.,	“	
	Sec. 2, FRL		44.32
	Sec. 3, FRL		39.77
	Sec. 4, FRL		36.18
	Sec. 8, FRL		117.14
	Sec. 10, FRL		157.95

Agency/Use	Legal Description	Serial/PLO No.	Acres
	Sec. 11, FRL		280.05
	Sec. 12, FRL		328.29
	Sec. 13, FRL		410.12
	Sec. 14, FRL		487.80
	Sec. 15, FRL, 41.61; FRL, 39.53; FRL, 41.05:		122.19
	Sec. 17, FRL		39.64
	Sec. 21, FRL, 41.02; FRL, 39.42:		80.44
	Sec. 23, FRL		41.77
	Sec. 24, FRL, 80.60; FRL, 201.11:		281.71
	Sec. 25, FRL		205.45
	Sec. 26, FRL		406.41
	Sec. 27, FRL		78.53
	Sec. 28, FRL		121.78
	Sec. 29, FRL		39.72
	Sec. 30, FRL, 39.98; FRL, 36.81; FRL, 80.48:		157.27
	Sec. 31, FRL		39.60
	Sec. 32, FRL, 38.77; FRL, 39.35:		78.12
	Sec. 33, FRL		39.00
	Sec. 34, FRL, 117.89; FRL, 40.67:		158.56
	Sec. 36, FRL, 41.11; FRL, 240.78:		281.89
TVA – Elk River	Huntsville Meridian T. 3 S., R. 7 W.,	ALES 36765	
	Sec. 34 – Parcel 1, Metes and Bounds (Lock B)		19.50
	Sec. 35 – Parcel 2, Metes and Bounds (Lock A)		29.41
TVA	Huntsville Meridian T. 6 S., R. 5 E., Sec. 6, Lot 1	ALES 36766	2.90
Army Corp of Engineers (COE)	Huntsville Meridian T. 15 S., R. 8 E., Sec. 24, SESE	ALES 49553	1,160.00
USFS Talladega N.F.	Huntsville Meridian T. 13 S., R. 9 E., Sec, 28, SE; T. 17 S., R. 8 E., Sec. 34, NE, SW, S2NW	ALES 52032 PLO 7605	559.48

Agency/Use	Legal Description	Serial/PLO No.	Acres
National Park Service (NPS)	Huntsville Meridian Cherokee County: T. 8 S., R. 9 E., Sec. 1, Lots 1-4; Sec. 2, Lots 1-3; Sec. 10, Lots 1, 2; Sec. 11, Lots 1-6; Sec. 12, Lot 1; Sec. 14, Lots 1-3; Sec. 15, Lots 1-4; Sec. 22, Lots 1-4; Sec. 23, Lots 1-4; Sec. 26, Lots 1, 2; Sec. 27, FRL E2NE; Sec. 27, Lots 1-5; Sec. 28, Lot 1; Sec. 33, Lots 1-4; Sec. 34, Lots 1-2 Dekalb County: T. 8 S., R. 9 E., Sec. 1, Lots 1-4; Sec. 2, Lots 1-3; Sec. 10, Lots 1, 2; Sec. 11, Lots 1-6; Sec. 15, Lots 1-4	P.L 102-427	1,625.19

Table I-2. Withdrawn Lands in Mississippi

Agency/Use	Legal Description	Serial/PLO No.	Acres
FERC		ES-2740 WR	8.17
FERC		ES 2843 WR	2,708.30
COE – Improvement of Black Warrior & Tombigee Rivers		ES 36758 WR	63.00
Army – Camp McClellan Military Reservation		ES-36759 WR	840.00
Abandoned – Military Reserve		ES-36761 WR	296.50
NPS – Horn Island		BLM-044621 WR	2,514,00
NPS – Petit Bois		BLM-045555 WR	748.00

Agency/Use	Legal Description	Serial/PLO No.	Acres
USFS – Harrison Experimental Forest		BLM-046329 WR	40.00
COE – Flood Control (Big Black River)	See file M&B	ES-36892 WR	0.29
U.S. Fish and Wildlife Service (USFWS) – Noxubee		ES-36893 WR	52,620.00
NPS – Ackia Battleground National Monument		ES-36894 WR	49.15
USFS – Holly Springs		BLM-062875 WR	39.48

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APPENDIX J—SUMMARY OF THE REASONABLY FORESEEABLE DEVELOPMENT SCENARIO

EXPECTED DISTURBANCE FROM OIL AND GAS

The expected level of disturbance from the projected oil and gas wells was determined using reasonable assumptions about a generic well site and access needs. Typically 2 to 5 acres are cleared for construction of a well pad. However, depending on the topography of the well site and access area, this construction may require the creation of cut slopes and fill areas which may disturb additional acres. Constructed roads typically have a width of approximately 30 feet. The length of the road is dependent on the well site location in relation to existing roads or highways. The average length of roads per well is 1/3 of a mile. Pipelines and/or flow lines will be constructed in conjunction with road construction to minimize additional disturbance. Pipeline rights-of-way are generally 30 feet wide, however widths could vary depending on ground conditions. Pipeline depth must be at least 48 inches. When possible, a common collection point will be established to minimize the number of production sites. The producing well sites will be reduced to a maximum long-term disturbance area of ¼ acre (10,000 square feet) after the well is put into production.

The Reasonably Foreseeable Development Scenario (RFDS) projects the number of wells anticipated to be drilled over the next 20 years. The following is a summary RFDS for Alabama and Mississippi.

ALABAMA

In Alabama, BLM projects that 20 wells accessing non-USFS FMO would be drilled over the next 20 years. BLM projects that the 20 wells would disturb approximately 105 acres. Table J-1 displays the RFDS and associated surface disturbance for Alabama by mineral and surface ownership.

Table J-1. Reasonable Foreseeable Development Scenario for Alabama

Mineral/Surface Owners	Number of Wells	Total Acres Disturbed
Federal/non-USFS	20	105
Federal/USFS	12	61
Non-Federal/non-Federal	3,988	20,750
Total	**4,020**	**20,916**

Oil and gas development on the Alabama surface tracts is not expected. This is a function of the high potential of the beach and highway tracts on the Fort Morgan Peninsula to have commercial development when combined with adjacent lands. These tracts can be developed by wells drilled in the nearby off-shore waters. Also, the engineering problems presented by the river tracts with the associated increase in costs preclude the surface use of those tracts as the mineral estate can be more inexpensively developed from adjacent lands.

MISSISSIPPI

In Mississippi, BLM projects that 10 wells accessing non-USFS FMO would be drilled over the next 20 years. BLM projects that the 10 wells would disturb approximately 55 acres. Table J-2 displays the RFDS and associated surface disturbance for Mississippi by mineral and surface ownership.

Table J-2 Reasonable Foreseeable Development Scenario for Mississippi

Mineral/Surface Owners	Number of Wells	Total Acres Disturbed
Federal/non-USFS	10	55
Federal/USFS	350	1,925
Non-Federal/non-Federal	11,650	57,820
Total	**12,010**	**59,800**

Oil and gas development on the Mississippi surface tract is not expected. The engineering problems presented by this low lying marshland tract and the associated increase in costs preclude the surface use of this tract for mineral development. The mineral estate may be more inexpensively developed from adjacent lands.